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The Journal

OF THE

EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

JANUARY, 1927.

No. 28.

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Additional copies to Members, Shs. 5/-; to Non-Members Shs. 8/-.
(Date of publication April, 1927.)

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The Journal

OF THE

EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

January, 1927.

No. 28.

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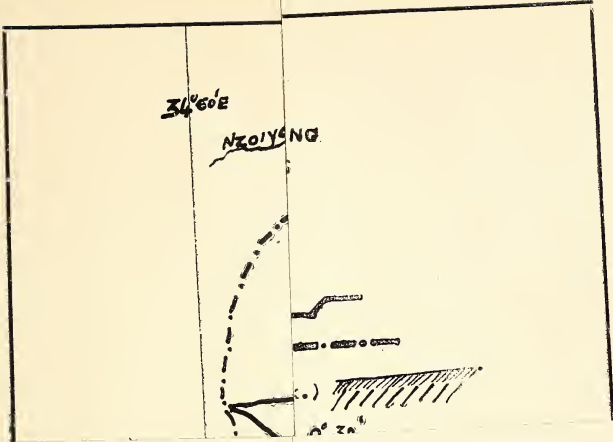
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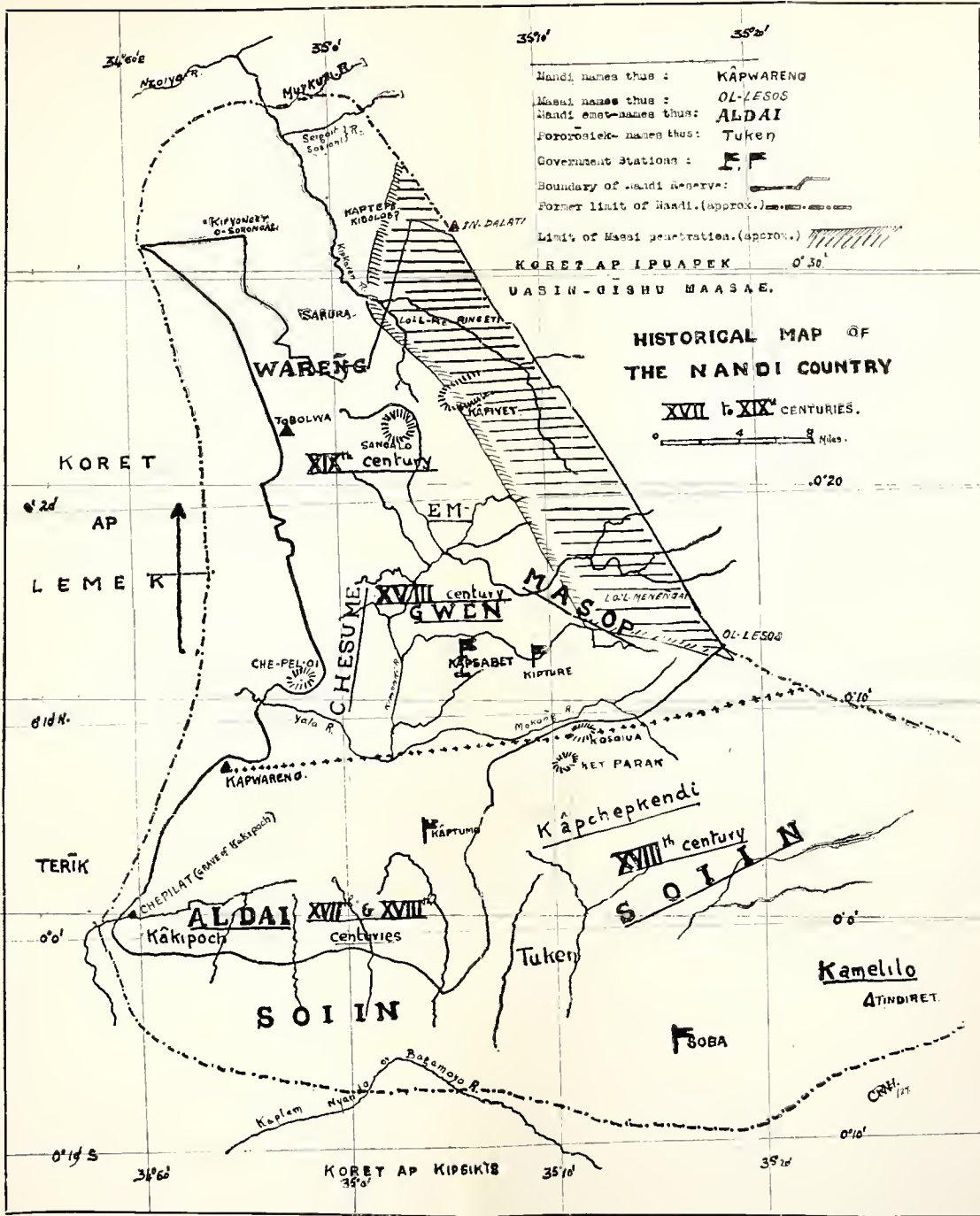
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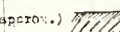
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Nandi names thus : **KAPWARENG**
 Maasi names thus : **OL-LESOS**
 Nandi smet-names thus : **ALDAI**
 Fororotiek- names thus : **Tuken**
 Government Stations : 
 Boundary of Nandi Reserve : 
 Former limit of Maasi. (approx.) : 

HISTORICAL MAP OF THE NANDI COUNTRY

XVII to XIXth CENTURIES.

0 4 8 Miles.

KORET AP IPUAPEK 0°30'
 UASIN-GISHU MAASAE.

0°20'

0°10'

0°0'

0°10'

35°0' 35°20'

34°00' 35°0'

34°00' 35°0' 35°10' 35°20'

0°20'

0°10'

0°0'

0°10' S

KORET

AP

LEMEK



WARENG

XIXth century

EM

XVIIIth century

GWEN

MASOP

KAPABET

KIPTURE

CHESUME

CHE-PELOI

KAPWARENG

KAPTUNG

Kapchepkendi

XVIIIth century

SOIIN

Tuken

ALDAI XVII & XVIIIth Centuries

Kakipoch

SOIIN

Kamelilo

ATINDIRET

SOBA

KORET AP KIBIKIB

CRH 121

REMARKS UPON THE HISTORY OF THE NANDI TILL 1850.

By G. W. B. HUNTINGFORD.

The reconstruction of the early history of a primitive people is based, not upon documentary evidence, but upon their ancient monuments, traditional lore, place-names, and, to a certain extent, their language. The existing tribes of east Africa possess few ancient monuments of their own—such remains as occur belong to a now vanished people—and the Nandi, who are essentially a pastoral tribe, and not adapted to the labour necessary to produce lasting works, can point to none, neither in their present territory, nor in areas formerly occupied by them, nor in the lands of other tribes of this sub-group. We are thus left with their traditional lore, place-names and language as sources of information. With their origin we are not here concerned; such facts as are known or conjectured will be found in Mr. A. C. Hollis's work, 'The Nandi: their language and folk lore', p.1; in his work on the Masai, p. iii; and in a paper by the present writer entitled 'On the connection between Egypt and the Masai-Nandi group' in *Ancient Egypt*, pt. 1, 1926, p. 10.

We thus start where tradition begins. The Lako, a Nandi tribe now living on Mount Elgon, say that they and the Nandi once lived on Mount Kamalinga, forty-five miles north-west of Elgon. (C. W. Hobley in the *Journal of the Anthropol. Inst.*, 1903, p. 332.) From this place they moved to Elgon, and while settled there, split up into more or less separate divisions. (It is perhaps significant that there is no true Nandi word for 'tribe,' the word used in Suk, *pereris*, having the appearance of being a distortion of the Masai *ol-orere*.) The first seceders appear to have been the Suk, who broke off at a time when the group language was in a very unformed state, having then no definite article, a peculiarity still retained in Suk. I am aware that Mr. Beech (*The Suk*, p. 2) gives a somewhat different account of the origin of the Suk; he says, "the old men are unanimous in declaring that there 'always were two original Suk tribes living on the Elgeyo escarpment' . . . Fugitives and adventurers from Sambur, Rudolf, Moiven, Karamojo, and Nandi intermarried with the two original tribes, and thus the Suk nation was evolved."

I admit there is a considerable admixture of 'foreign' blood in the Suk; but this appears to have come in since the secession from

Elgon, and the linguistic evidence points to the Suk being a primitive tribe of Nandi, who still retain their primitiveness.

At a somewhat later period, i.e., after the adoption of a suffix equivalent to our definite article, the tribes who now compromise the eastern Nandi moved away, this branch being now represented by the Endo or Chep-bleñg (still rather primitive), the Tuken or Kamasya, the Marakwet and the Keyu or Elgeyo. Another branch moved southwards and settled in the districts now called Lumbwa and Sotik; this comprises the Kipsikis or Lumbwa, the Puret or Buret (=mist) and Soot or Sotik. The people who call themselves Terik, and who are called Nyañori by their Bantu neighbours, now settled west of Nandi, are perhaps an offshot of the Kipsikis branch.

While these migrations were in progress, part of the original stock stayed on Elgon, where they are still found; they comprise the Kony,* Sapeiny or Sabei, Lako, Pök, Mbai and Sabaut; a seventh tribe is mentioned by Mr. Hollis (Nandi, p. 2) under the name of Kâpkara, which seems to be an error, since Kâpkara is a district of the Sabei country, and the tribe—names of this sub-group do not begin with the prefix kâp (=ka-ap, house, place or family of; the name Kâpkolosia, which might be quoted as an exception, is a sort of nickname given to (1) the Terik, (2) the Bantu Kavirondo in general by the Nandi.)

Up to this time, the tribe now called Nandi had not been formed. The traditional Nandi account is that the first settlers in their country came from Elgon, and formed the Kipoiis clan; this name possibly means 'the spirits,' and the name of one of these settlers is recorded as Kakipoch. He is said to have settled in the *emet* (country) of Aldai in south-western Nandi, and gave his name to a geographical division (*pororiet*). The site of his grave is still shown on Chepilat hill in Aldai, and is marked by the stump of an ancient olive tree; the account of his burial is that his body was laid on ox-hide, together with his possessions, and left for the hyaenas. Kakipoch's people were joined by a few Kipsikis, who were followed by people from the other branches. The Nandi account of the formation of their 17 clans is that four came from the Elgon and Lumbwa groups, viz. the Kipoiis, Kipamwi, Kipkenda and Kipiegen; one wholly from Elgon, the Kipkokos; five from the Elgon and Elgeyo groups, the Kipsirgoi, Moi, Sokom, Kiptopke and Kamwaike; four from the Lumbwa branch alone, the Tungo, Kipaa, Kipasiso and Kâpchemuri or Chemur; and

* Commonly, but wrongly, called Elgoni. The plur. of this word in the Kony dialect is 't-Kony (a Masai form, where 'l=il, not el.)

the remaining three from the Lo-'sekelaē Masai, viz., Kipkoiitim (partly also from Elgon), Talai, the medicine-men's clan, (partly also from Kamasya) and Toiyoi. The historical order of the clans is probably somewhat as follows: Kipoiis, Kipkokos, Kipamwi, Kipkenda, Kipiegen, Tungo, Kipaa, Kipasiso, Kâpchemuri Kipsirgoi, Sokom, Moi, Kiptopke, Kamwaike, Kipkoiitim, Toiyoi, Talai.

The Nandi were originally called Chemwal, by which name they are still known to the Suk (Chemwel), and to the Masai (il-Teñgwal). Their country is said to have been called Chemñgal (Hollis, Nandi, p. 99); it is possible that this name contains the Turkana word ñgaal, 'the camels', and it may be connected with the tradition which accounts for the origin of circumcision in Nandi, which is that a man called Kipkenyo (= 'the man of old') came from a country called Do, which was to the east of the Uasin Gishu plateau (or Angata na-nyokye, 'the red plain'), and settled in the porriet of Kâkipoch, and there circumcised his children, because his brothers and sisters "all died when they reached puberty, so Kipkenyo decided when he had a number of children of his own to 'change' them all at this age. He therefore circumcised them, and as none of his children died, the Nandi followed his example." (Hollis, Nandi, p. 99). Sir Charles Eliot has suggested, with some probability, that this rite may have been borrowed from camel-riding Muhammadans. (Hollis, Nandi, p. xv.) He quotes Sir H. H. Johnston (Uganda Protectorate, p. 760) as saying that none of the Nile races, who form one side of the ancestry of the Nandi, circumcise when free from Muhammadan influence.

THE SETTLEMENT OF THE NANDI COUNTRY.

The determination of the stages of the settlement of the Nandi country is a matter of some difficulty. We have seen that Kâkipoch and his people chose the part now called Aldai, in S.W. Nandi. It seems to be a fact that the Nandi tribes avoided open plains, such as the Uasin Gishu plateau (where there are no Nandi place—names of historical value), which was perhaps not occupied by the Masai when the first Nandi left Elgon, as no traditions have yet come to light of encounters between the Masai and Nandi at this period. The Nandi came from a mountainous country, and settled themselves in wooded and semi-mountainous districts. The eastern tribes chose the hilly region of the Elgeyo and Kamasya escarpments, and Kâpcherañgany hills, and even Lumbwa "though a low district relatively to Nandi, is not a plain like the Rift valley, and is very uneven." (Hollis, Nandi, p. xv.)

Southern and western Nandi, to which the first settlers went, is very hilly. Western Aldai is a country of deep, precipitous river-

valleys, very rocky, but with fertile soil between the masses of rock. Soin, the former eastern emet of Nandi, is a mountainous district, containing the Tindiret hills, which are well wooded. To the west and south of these areas are the Nandi escarpments. North and central Nandi consists of shallow river-valleys, with wide undulating water-sheds, moderately well wooded, except on the east, where, however, the name Masop points to the former presence of forests. The land rises a little on the west, to descend again in an escarpment to Kavirondo; it merges on the east into the Uasin Gishu plain. Rocky hills appear in the north, the most prominent of which are Sañgalo, Kâpiyet, and the ranges of Sarura, Kipyonget (or O-sorongai) and Kâmulat-Kâptepe (the latter better, though wrongly, known as Kibolos). In this part, and particularly in the north, are found in great numbers the ruins of hut-circles, of stone and of earth, which are called by the Nandi ' mukowanisiek ', and which are ascribed by them to the ' Sirikwa ', who, it seems, were really a division of the Uasin Gishu Masai, and whose name appears to have been taken by the Nandi as a general term for ' the people who were before us ' (just as in England prehistoric remains are often called ' Druidical ' by the ignorant.) With the question of who this people was we have no concern here (see the Journal of the E. Africa and Uganda Nat. Hist. Soc. Jan. 1926, pp. 24, 25.) but one thing is certain, and that is, that these circles (and other antiquities) are the remains of a people who preceded the Nandi. Whether they had gone before the Nandi arrived in Aldai, we cannot say definitely; but such remains do not occur* in the area first settled by the Nandi, and it is possible that there were still some ' Sirikwa ' left in the north, enough to prevent the Nandi from attacking them till they had consolidated their position, and proved themselves formidable enough to drive them out. Mr. Hollis says (Nandi, p. 2) " I do not consider it at all certain that the Nandi country has been inhabited by the Nandi tribe for more than a few generations." A reasonable length of time to allow for the settlement of the country may be taken to be about 250 years, which is nearly 5 circumcision cycles of the Nandi (a cycle is about $7\frac{1}{2}$ years), and gives us the last quarter of the XVIIth century, or 1675—1700 as an approximate date for Kakipoch's settlement. The hut-circles of north and central Nandi are, therefore, at least as old as this, and probably older.

Assuming, then, that the last quarter of the XVIIth century is a tolerably approximate *terminus a quo*, we may work from that period in attempting to reconstruct the stages of the settlement. The first part to be settled, we know, was the south; it certainly formed more

* Except on the escarpment itself.

or less the present *emet* of Aldai on the west, and probably the former *emet* of Soiin on the east; and it may be conjectured that the first *pororosiek* were Kâkipoch in Aldai and Tuken in Soiin. The presumed limit of this settlement is shown on the map by the red dotted line drawn from Kâpwareñg eastwards through Kosoiua. During the XVIth century, as the tribe grew, it advanced northwards, and occupied the *emotinuek* (pl. of *emet*) of Chesume, Em-gwen and Masop; at the same time, more *pororosiek* were formed. It is possible that in this period, the Nandi may have come into contact with the 'Sirikwa', if any of them were left; we have, however, no traditions of this. The final expansion of the tribe was about the beginning or middle of the XIXth century, when the southern part of Wareñg and the lower Kipkaren valley were occupied.

During the early part of the XIXth century, the Nandi came into contact with the Uasin Gishu Masai. (The Masai were at the height of their power about 1800-1850). A story recorded by Mr. Hollis (Nandi, p. 106) called 'How the Masai were first repulsed by the Nandi,' begins with the words "at the time when the Masai occupied some of the Nandi grazing-grounds." It is not certain how much stress can be laid on this excerpt, but it seems to imply that north and eastern Nandi were not permanently occupied by the Masai. It also confirms the evidence offered by certain Masai place-names in eastern Nandi, which indicate that the Masai had temporary possession of a strip of Nandi roughly 5 miles wide; the names in question are, from N. to S., 'N-dalat, in location 3; Lo-'l-keringeti ('the of the ditch')* in loc. 2; 'N-dulele ('the solanum campylanthum plant') in loc. 3; Ol-o-goliet in loc. 3; Lo-'l-meneñgai ('the of the corpses') and 'N-dupeneti in loc. 5; and Ol-lesos in loc. 6, the latter on the border. These names are now used as district (*koret*) names by the Nandi. The place called Lo-'l-meneñgai takes its name from the numerous stone cairns there, which the Nandi call 'makuonik,' and which they say (with great probability) are the graves of Uasin Gishu Masai who were killed in battle, not with the Nandi, but with other Masai. These cairns also occur in 'N-dupeneti. That these cairns are Masai can hardly be doubted, in face of the tradition; and we know that the Masai erect cairns in certain cases. (Hollis, Masai, p. 305). The inference to be derived from these cairns is that the Masai occupation though not permanent, was yet of some length, perhaps 50 years. It is probable that they were driven out about 1850, since about that time the Uasin Gishu Masai were attacked by the En-aiposha (Naivasha) and Kisongo Masai, and destroyed, the remnant being annihilated by the Nandi. "Another branch called 'L-osigella or Segelli [Lo-'sekela] took refuge in the Nyando valley but were wiped out by the Nandi and Lumbwa." (Hollis, Nandi, p. xv.) It was from these that the Nandi obtained their system of rule by medicine-men.

Formerly Nandi comprised six *emotinuek* or counties, which contained 15 *pororosiek* as follows :

Soiin: Kâmelilo, Kâpchepkendi, Tuken.

Aldai: Kâpianga, Kâpsile, part of Kâkipoch.

Masop: Koileke, parts of Kâpchepkendi and Kâkpiptalam.

*or, ' of the fort.' †The 'L-Aikipyak, according to some.

Wareñg: Parts of Kâptumoiis and Kâkipoch.

Em-gwen: Kâptumoiis and Kâpsiondoi.

Chesume: Tipiñgot, Cheptol, Kimñgoror, Kâkimno and Murk ap Tuk, or Kâpwareñg.

At the time of the British administration of the country in 1896* the area embraced by these divisions extended from the Tindiret hills, to about the present limit near Chepilat, and included a large part of the plain below the escarpment on the south through which the railway now runs, which is still called Soiin by the Nandi. On the east and west the boundary has remained more or less unchanged; while on the north, it extended approximately to the Murkusi river. In 1906, after the close of the Nandi War, the whole of the *emet* of Soiin comprising the Tindiret hills and the uat land to the south, was cut off from the tribe; which necessitated a re-distribution of the *pororosiek*, which are now divided as follows :

Soiin: none.

Masop: Kâkpiptalam (part of), Koileke (part of.)

Wareñg: Tipiñgot (part of), Kâpchepkendi (part of), Kâmelilo, Kâkipoch (part of).

Em-gwen: Kâptumoiis, Koileke, (part of), Kâkipoch (part of), Kâpchepkendi (part of), Kâpsiondoi, Tuken, and Kâkpiptalam (part of).

Aldai: Kâpsile, Kâpianga, Kâpchepkendi (part of), Kâkipoch (part of), Tipiñgot (part of).

Chesume: Kâkimno, Cheptol, Kimñgoror Murk' ap Tuk', Tipiñgot (part of).

Besides these, there are a number of smaller divisions called *koret* (pl. *korotinuek*) which almost correspond to our 'parish'; and still smaller ones called *siritiet* (pl. *siritaiik*) which may be compared, in point of size, to our 'tithing', or 'township'.

* The first station was at Kipture, some 4½ miles east of Kâpsabet.

THE NANDI SYSTEMS OF GOVERNMENT.

The modern system of 'orkoinotet' or rule by an *orkoiyot* (medicine man) is a recent development, and was borrowed direct from the Masai. Previous to this, the government seems to have been in the hands of *kiruogik* or councillors (sing. *kiruogindet*, from *iruoch* (to consult). As we have no definite information as to the system pursued prior to 1850—the approximate date of the introduction of the *orkoinotet*—it may be of service to review briefly the methods used by other kindred tribes.

(1) The Suk. "The Suk have no chiefs whatever of their own, though two of them have been created Government headmen. Each village is a family, having its old man at the head. Clusters of villages collect round one of these old men, who may be celebrated for his wisdom or wealth or both, and he is henceforth distinguished from the others by the name *ki-ruwok-in* or adviser. He, however, has no real authority, and the young men seldom trouble to obey him unless it suits their own purpose to do so. There is no word for 'chief' . . . It follows necessarily that there is no hereditary succession." (Beech, Suk, p. 6).

(2) The Endo. "This tribe have apparently four chiefs (i.e. in 1910) . . . Offenders against the decrees of these are brought before an assembly of all or any one of the sections. Judgment is passed after the elders have expressed their opinion. A black and white goat skin is worn by the chief. No other may wear it. A chief if dying points out his successor. If he fails to do so, his successor is appointed by general election." (ib. p. 36).

(3) Turkana. The Turkana have "two grades of chiefs: (1) *Lemurok* or medicine men; (2) *Lekatuknok* or advisers. These two grades exist side by side . . . *Lemurok* are hereditary." (ib. p. 36).

(4) En-jemusi. "There is a supreme chief with supreme power; but judgment is usually passed in accordance with the opinion of a council of elders. If a man disobeys a chief, he is beaten. If he continually does so, he is expelled from the tribe. The chief's son succeeds." (ib. p. 37).

(5) Kony. The Kony have three divisions, called Kiporitiek, Kipsaratuk and Somekek, over each of which is a chief called *mgoriondet* (pl. *mgorenik*) under whom are sub-chiefs (*mgorenik che mingechen*). In 1923, the three chiefs were called Arap Kieptek, (Kiporitiek), Arap Kasisi (Kipsaratuk) and Arap kiepkwony (Somekek). These chiefs may or may not be *orkoik*; of the three named above Arap Kieptek alone was.

(6) Keyu. The Keyu appear to have a system of councillors (*Kiruogik*); they have no other word for 'chief.'

The tribal authority, such as it is, is thus seen to have grown from the adoption of an old man as 'family elder', which is still seen among the Nandi, who in each district have a *poiyoṭ ap oret*, the clan elder, and for each family group a *poiyoṭ ap kokwet*. The word *kokwet* has three meanings: 'neighbour,' 'small place of assembly', and 'family group'. The family groups are distinguished by tree-names, such as *Simotuēt*, *Teldet*, *Choruēt*, *Mokoīyuet* (all species of fig), *Tepeswet* (*Croton* sp.), *Kakoruēt* (*Erythrina tomentosa*), *Kipuimetyēt*, *Kimoluēt* (*Vangueria edulis*), *Mopet* (*Dolichandrone platycalyx*), *Kipsakchat* (*Bauhinia reticulata*), etc. The fig-trees seem to predominate. The *simotuēt* (nr. *F. elegans*) is regarded "as almost sacred" (Hollis, Nandi, p. 87), and a species of fig, generally *teldet* or *choruēt*, is chosen as the council tree (*kâpkiruogēt*) of the district elders; the fig-tree, in short, is regarded with special favour, almost with reverence as it is all over Africa and India (A. Werner, *The Native Races of British Central Africa*, 62, 63.) and as it was in ancient Egypt. The predominance of the 'council-tree species' as a family name, and the meanings of the word *kokwet* support a theory that whatever it is now, the *kokwet* arose from the grouping of a few neighbours—probably related—round a tree for various social purposes, and that the *poiyoṭ ap kokwet* arose in the same way as the Suk *kiruwoḱin*. These 'family elders' may originally have been called *kiruogindet*, and as they acquired more power, ceased to be 'family counsellors', and became 'district councillors'. The lesser officers were called *kiptaiyat* (pl. *kiptaienik*) who were in charge of a *korēt*; and *olaitoriot* (pl. *olaitoriniki*) who were over a *sirīeiet*, and were responsible to the council of the *kiruogik*. The *olaitoriot* has dropped out of use now as an official title, and is used to mean 'rich man'; the *kiptaienik* are retained by Government.

About 1850, however, the Masai system of *orkoinotet* was introduced. The Masai word for medicine man is *ol-oiboni* (from *bon* to make medicine); the word taken by the Nandi to denote the office was *orkoiyoṭ* (pl. *orkoiik*). This term was not a new one, but had been in use earlier (Kony, *orkoandet*; Suk, *werkoiyon*), and had more or less the meaning of the Swahili *mganga*, "a native doctor, medicine man—, the recognized representative of superior knowledge on all subjects mysterious to the native mind, and regarded with respect, fear or toleration accordingly." (Madan's *Swah.-Eng. Dictionary*, s.v.) *Mganga*.) It was distinct from the other species of witch-doctor, which dealt in black magic, and corresponds to the Swahili *mchawi* (*N. ponindet*; Suk, *ponin*).

These new *orkoiik* formed a clan of their own, called *Talai*, to which all *orkoiik* belong. The head of the clan is also the chief of the

tribe; he foretells the future, interprets omens and is generally regarded as one possessing supernatural powers. His position is hereditary. Under the *orkoik* a dual system of councillors was instituted. The *orkoiyot* appointed a *motiot* (pl. *maotik*) in each *pororiet*, and the people appointed a *kiruogindet*. The *kiruogik* were responsible to the *orkoiyot* through the *maotik*.

The Nandi have thus had two separate systems of government which have become mingled. But it cannot be said that there is or ever has been any tribal authority which can enforce obedience to its orders. The *orkoik* have more power than the older *kiruogik* had; it is not, however, the power of constituted authority, but the influence which results from fear. Such control of the country as there is is really in the hands of the 'circumcision age' (*pinda*) in power, the members of which are always the youngest generation of warriors. The *orkoiyot* and his men have no constituted authority over these, but from their position as powerful medicine men, they possess a certain degree of influence.

ON THE ORIGIN OF VARIOUS TRIBES OF KENYA AND UGANDA OTHER THAN BANTU.

(A reply to Mr. C. C. Luck's essay on the origin of the Masai,
Journal for August, 1926.)

by C. L. BOLTON.

Mr. Luck has put forward two theories in his essay

(1) That the Masai are the actual descendants of the half tribe of the Manasseh from the west of Jordan, and the Nandi of Moab.

(2) That many proofs exist of the influence of the ancient world civilisation of Egypt-Mesopotamia on central Africa.

Dealing with theory No. 1, the following arguments against it are submitted.

I. Linguistic. Sir C. Eliot had put the case against a semitic origin for the Nilotic languages in his Introduction to Hollis' book "The Nandi". His arguments have not been answered, and the identification of a few place and clan names, which are in some cases open to criticism, e.g., Masai from Manasseh, is not of great weight when balanced against his case. All the Nilotic languages appear to

be of common origin. If the Masai derive from Manasseh, it is probable that a proud and fairly civilised tribe like Manasseh would retain their whole language and not merely a few place and clan names. In that case all the Nilotic languages derive from Manasseh, but Sir C. Eliot's arguments prove that they do not. Alternatively Manasseh adopted the Nilotic language, i.e., that of an uncivilised and primitive savage tribe in preference to their own which is very unlikely.

II. The chosen race argument applies to practically any nation, which, from its prowess in war, considers itself the leading race in a district. The Kshatriya caste in India, ancient Rome, Spain in America in the 16th Century, the Turks, the Germans in 1914, the English and the inhabitants of "Gods own country" all exhibit this very common tribal trait.

III. Physical. Is there any shred of evidence physically of Semitic blood in the Masai-Nandi? A semitic cross tends to fat, not to the slim sinewy physique of these tribes. Neither hair, features nor coloration are in the least Semitic. Judging by anthropological research in Europe, there has not been sufficient time for the enormous physical change to have taken place from the Manasseh physique to the Masai-Nandi physique from the date given by Mr. Luck to the present day.

IV. The Nandi group are usually regarded as of common blood with the Masai. Mr. Luck suggests Moab as their source, but gives no evidence of a Moabite migration to central Africa. If Chemosit derives from a Moabit God, why does he rank as a devil amongst the Nandi? Presumably because he is of Egyptian and not Moabite origin, having become a devil in Egypt. Also Mr. Luck shows that the term he is given by the Nandi is due to their misunderstanding an Egyptian drawing.

V. Practically all the evidence ingeniously collected by Mr. Luck points direct to Egyptian influence, and it is a priori more likely, that such influence would have made itself felt from Egypt itself, and not from Canaan or a Canaanitish tribe in Egypt, *e.g.*,

- (1) The identification of Ngai with Ai of Sumer and Hathor of Egypt.
- (2) The good Black and evil Red God.
- (3) The allusion to heres as bulls.
- (4) The pariahdom of the smith caste.
- (5) The Chemosit vide paragraph preceding this.
- (6) The Dinet and Didity legends are more reminiscent of Egypt or Mesopotamia than of a hilly country like Palestine.

(7) The circumcision ceremonies.

Further evidence may be submitted

- (a) The habit of spitting for luck and as a greeting is common amongst Mediterranean races to which the early Egyptians belonged.
- (b) The dislike of swine.
- (c) Bewitching by means of anything that has proceeded from the body of a person.
- (d) Dislike of using given names from fear of bewitchment.
- (e) The sun worship of the Nandi.
- (f) May not the word L'Oibon be derived from the Egyptian word for snake and wizard. This suggestion is made on the authority of a work of fiction, the writer not being acquainted with the ancient Egyptian, so it may be merely ridiculous.

VI. MOSAIC TRADITIONS.

Sir C. Elliot throws doubt on the authenticity of Merker's researches, but this seems unfair. It will be noted that the tradition of the flood is not confined to the Jews, and that the Masai Ten Commandments are quite different to the Mosaicones. Also the introduction of Chemosit as an angel points to two different legends having been mixed up. When we remember the intense racial pride of the Jew, it is unlikely that Manasseh would have allowed their national traditions to deteriorate into the state in which they are found amongst the Masai, nor would knowledge of them be confined to a few families; they would have been retained and taught as a heritage of which the whole tribe would have been proud. There are three possible explanations of these traditions.

(1) That they originated in Egypt before the Jews left the country and were adopted by the Jews, and that from Egypt they also reached central Africa.

(2) That they were introduced by Mahomedan raiders from Somaliland.

(3) That Jewish traders carried them up the Nile valley and that they reached the Masai together with the Egyptian traditions from that source. This appears the most likely explanation and is borne out by the form in which they exist i.e., that among the Geyu where Musana removed the King's people sounds as if it came from Egypt, as a Jew would not have spoken of the people removed as being the property of the king of Egypt.

It will be seen from the above that all that can legitimately be deduced from the evidence is that the central African tribes, the

Masai, Nandi, Kikuyu, Wakamba and Kitosh were subject to influence from the old world civilisation of Egypt, and in the case of a few families to Jewish tradition. There is no proof of actual descent from any Jewish or Canaanitish tribe. The history of the Aryan controversy shews that common language and common religion are not a proof of common blood and a consideration of the spread of the English language and the Christian or Mahomedan religion at the present day will convince anyone of this.

The writer believes that from a consideration of the evidence collected by Mr. Luck and from other sources that an alternative theory can be put forward as to the origin of the Masai, Nandi, and of other E. African tribes.

The country between the Sahara and the Red Sea and Indian Ocean forms the only bridge between South Africa and North Africa and Eurasia open to non-seafaring races. In such an area we may expect to find a mixture of tribes and hybrid tribes of mixed blood from the countries on either side of the bridge.

Difficulties of water and food render mass migrations very unlikely since the present dessication of Africa. This area contains various groups of tribes with which we will deal in order.

(1) The Bantu are evidently of one origin with the Bantu of South Africa.

(2) The Somali-Galla group. According to Herodotus, Somaliland Eritrea and at least part of Abyssinia were inhabited in his day by Macrobian Ethiopians, whilst the Nile valley was inhabited by Ethiopians with a king at Meroe. Between Meroe and Egypt there was constant communication and migration, but the Macrobian were a virile independent race, who were never conquered by Egypt nor Persia. When Cambyses went against them, he had to get guides from Meroe as no Egyptians were capable of guiding him. The Macrobian are described as men of fine physique, living on boiled meat and milk, unacquainted with wheat or bread, regarding physical strength and courage as a criterion of fitness to rule, independent, clever, and from their long isolation and ignorance of the civilised world, contemptuous of foreigners civilised or otherwise. They had no wish for foreign conquest and were quite content to remain isolated, free and ignorant of civilisation. These same traits are retained by the modern Somali. A race of this type capable of retaining independence and not ambitious of conquest would probably retain its country for thousands of years and there is no evidence to prove that the present inhabitants are not the lineal descendants of the Macrobian merely altered by their religion and possibly with a dash of Arab blood. The Galla would be colonists of the same stock who worked their way southwards.

(3) The Nilotic Negroes. The extreme blackness of these people, their primitive organisation, the difficulty of access to their country and the fact that they do not circumcise which according to Herodotus the Meroe Ethiopians did point to their isolation in their present dry hot country for several thousands of years. It is suggested that their language together with that of the Masai-Nandi is borrowed from a common source to be discussed later and that the Madi dialect is their primitive tongue.

(4) The Masai-Nandi. We have seen that tradition connects these people with Egypt. There is also evidence of Bantu influence (a) The spirit worship of ancestors by the Nandi; (b) The idea in their folk tales of the great wiliness of the hare Brer Rabbit; (c) Their marriage customs and the employment of women in agriculture; (d) The reverence paid to the hyaena as a walking family tomb. Neither Elgoyn Kitosh nor Waguishu would skin a hyaena shot in a trap on this farm and all were loath to handle the body except a Mahomedan boy. Each tribe said it would be desecrating their father's grave.

Language.—The languages of this group are not those of a very primitive pastoral race. There are many adjectives; the colours are not merely those of cattle; the numerals may not be merely loan-words from Galla; they may derive from an older source from which the Galla have also taken them; medicine is fairly advanced vide the number of parts of the body and diseases; the general vocabulary of verbs and nouns is fairly extensive. There are signs of Bantu influence e.g. the root *Wend* to go for a walk Nandi and *Enda* to go in Bantu; the root *sut* to carry Nandi and *Sut* to catch hold of in Kitosh. The Nandi use *M* before *B*, e.g., *Mbaret* the garden and before *K*, e.g., *Mkonget* the hoe (Elgoyn Masai) and *N* before *G*, e.g., *Ngotiot* the giraffe and before *Y* of which there are numerous examples. It would seem that the Bantu find it easier to use these prefixes and it is extremely probable that a hybrid Bantu race using an alien tongue would do the same, more particularly if Bantu by the female side, as the children would learn their mother's pronunciation.

Physique.—These tribes resemble the Bantu as much as, if not more than any other native race. Now that the Lako and Goyne [Is not Hollis wrong in calling them Kony. They call themselves Elgoyn and a Nandi driver of the writer's said the Nandi used to call them Koyn. Hollis never came into actual contact with them so he may have been misled] have abandoned their traditional style of hair-dressing it is difficult to distinguish them from Kitosh or even Waguishu except by their slimness and more wiry build. The writer has a Uasin Guishu Masai on the farm who looks just like a Durban Zulu. His "ndugu" is an undersized ugly man with a Kitosh wife. The Kitosh affirm that the Masai have been in the habit of taking Kitosh

women as wives, but that the Kitosh have never taken Masai women. This shews that the Nandi group are not above marrying Bantu women. The contempt of the Masai for the "Meg" is not incompatible with their being half-breed Bantu as it is notorious that a half-caste is always more contemptuous of the lower race in his ancestry, than a pure blooded man of alien race is. The Kipsigis and Nandi are more liable to malaria than the Bantu, but the Lako and Goyn are not. Either the former have lost their immunity from living on higher plateaux or the latter have attained it by living in more malarious districts.

It is suggested that the evidence given points to the Masai Nandi being of Bantu blood crossed by a race from Egypt. The writer believes that the Automoli of Herodotus are the race in question.

The Automoli.—The writer disagrees with Mr. Luck's deductions as to the Automoli. Herodotus states that they went to the King at Meroe, and therefore if we regard the Somalis as descended from the Macrobian, obviously the Automoli never reached Somali country at all. It is far more likely that they reached the upper waters of the Blue Nile and from there westwards to Fashoda.

There is no evidence of their being Canaanites. The half tribe of Manasseh could not possibly furnish 240,000 troops fit for enrollment as mercenaries in a standing army. At the time of David's census, when Israel was most flourishing Israel and Judah could only muster 1,300,000 males capable of service. Of this total half Manasseh would supply not more than 100,000 and of these not more than 40,000 would be of the right age and physique for enrollment as mercenaries. Possibly if there was a Jewish colony at Elephantine there were Jewish sutlers in the commissariat of the Automoli, from whom the Masai traditions reached certain Masai families.

Herodotus expressly states that the Automoli took no women or children with them. The soldier's reply to the king was typical of reckless youth with no regard for home ties and seems to have been meant to bear a literal meaning. Incidentally moving the women and children belonging to 240,000 men into Meroe Ethiopia ahead of the fighting troops would be extremely hazardous and difficult to manage. The king of Egypt appeals to the patriotism and religion of the Automoli in vain, but the fact that he does so, tends to prove that they were thoroughly Egyptianised foreigners, if not of pure Egyptian blood.

It is suggested that the Automoli reached the Fashoda Blue Nile area and found there Bantu tribes whom they drove southward and whose women folk they took and that from the Automoli warriors and the Bantu women the Masai Nandi group had origin. The Bantu

tribes driven south still exist as the Wakamba, Kikuyu and Kitosh. At the same time the Jalua Kavirondo and the Teso and Kunam moved southward from the indirect pressure of the Automoli.

There are two routes open to the Masai Bantu from the source of their origin when the Automoli drove out the Bantu tribes (a) Up the Nile valley; (b) via the Sobat river and Lake Rudolf through Turkana Suk and via Mt. Elgon. On route (a) we find a homogeneous race from the Shilluk southwards who do not resemble the Masai Nandi to any great extent traditionally or physically but whose language does resemble theirs. Along route (b) we find tribes of Masai Nandi blood as far north as Rudolf and tradition points to the Nandi having reached their present area via Mt. Kamalinga and Elgon. It seems probable therefore that route (b) was used by the Masai-Nandi. Subsequent incursions of the Masai-Nandi have been made southward along the plateaux and they have never conquered the lower country where either the lack of raidable cattle or elephant grass and papyrus swamp deterred them from penetrating.

An alternative theory is that the Automoli drove the Nilotic tribes of the Nile valley southward and took Nilotic women as wives and that the hybrid Automoli Nilotic race then swept southward and expelled the Bantu tribes from the plateaux. This theory is borne out by language and to a certain extent by physique, but it is difficult to see why in that case the true Nilotics did not learn circumcision and religion from the Automoli. Instead of this we find that the Masai-Nandi, Kitosh Wakamba, and Kikuyu have all been subject to religious influence of Egyptian origin in which circumcision plays a part, which we can ascribe to direct influence by the Automoli. Again the Masai Nandi are people of the high veldt a proof of Bantu rather than Nile valley ancestry. Physique and geographical distribution also points to Bantu rather than Nilotic ancestry. The language of the Nilotics may have been borrowed from the more civilised Automoli and there may be a small infusion of Automoli blood against the Shilluk who seem to be the most advanced of the group. It is suggested that the Automoli themselves were of mixed origin with a small portion of Mediterranean blood and a large portion of negro blood. Their influence amongst the Masai Nandi is shewn physically by the occasional appearance of Mediterranean features and by the susceptibility to malaria whilst the large share of Bantu blood shews in the other physical attributes of the Masai-Nandi.

The Bahima.—This tribe is described in the case of the men as of light complexion with occasional European types of features and in the case of women as of Hamitic negro type. They are generally supposed to be descendants of the Bachwezi who came from Egypt. The writer disagrees with this view. The Bachwezi who were the ruling

race in Bunyoro, Toro and Busoga were evidently of high civilisation as they were deified by the local savages. They were supposed to have reigned for a few generations and then to have left the country, handing the government over to chiefs of some other alien races. They are supposed to have introduced the art of working iron. It will be noted that in Herodotus time the then civilised world knew nothing of the sources of the Nile, but that not long after Ruwenzori and Victoria Nyanza were discovered and news carried back to civilisation. It is possible that the Bachwezi were the discoverers. A clue as to the origin of the Bachwezi exists in the story related in Ch. I of the Handbook of Uganda about Ndachura the last king of the Bachwezi, his mother Nyinamwiru and her father Bukuku which is practically the same as that related by Herodotus of Cyrus of Persia his mother Mandone and her father Astyages. May not Nd-Ahura be a Persian name? Persian troops were stationed at Elephantine in Herodotus' time and Meroe paid tribute of ivory, etc., to Persia.

The occurrence of this Persian folk tale and its application to the Bachwezi point to the Bachwezi being Persian adventurers, probably of noble birth, who carried the legend into Uganda where it was applied to the local Persian chief. If this is so, who were the Bahima? Physically they appear to be Hamitic negroes with a dash of Aryan blood. The following solution is suggested. The Persians employed native troops to a far greater extent than the British do to-day vide the catalogue of troops under Xerxes given by Herodotus. It is probable that Persian adventurers assisted by Hamitic negro subject troops from Meroe Ethiopia invaded Bunyoro and conquered it and that the Persians employed their Ethiopian troops as subordinate officials; that after one or two generations of Persians had ruled, they left the country and that the Ethiopians amongst whom were half castes from the Persians took over the government and form the present day Bahima. This solution based up to a point on the relations of British Indians and Africans in Kenya to-day may seem fantastic, but history repeats itself and in the actions of modern empires, we may find a clue to those of older ones, nor need we deny to the world-conquering Persians the exploring and colonising spirit shown by Europeans to-day.

With regard to the Borneans if Mr. Luck's theory connecting them with the Masai-Nandi is correct, it is possible that they also are a hybrid Mediterranean negro race. The negro element exists in Polynesia and the Mediterranean portion may come from ancient Someria by invasion by sea Engai may be Enki or Ea the Somerian river god and the Persian Gulf is nearer to Borneo than Edom, and the people from there were more civilised and probably more capable of long sea voyages. Modern discoveries in Somer point to it containing

two different types, one of which was probably Mediterranean. If a Mediterranean tongue was spoken by some of the ancient Sumerians and by the proto-Egyptians from whom it descended to the Automoli, any connection between the languages would be explained and the few Aramaic words in Borneo may be merely loan-words the result of subsequent trading intercourse in Solomon's time.

In conclusion, the writer wishes again to suggest that we must judge the actions of older empires by our own and when we consider how English and Christianity have spread to races with hardly a drop of English blood in their veins, we may expect moon goddess worship and ancient dialects to be found amongst races not connected by blood with the nations from which they learn their religion and language. Also from the old world civilisation, adventurers and traders would have made their way into the unknown even as Europeans have done recently. Here in Kenya and Uganda on the borders of an old time civilisation, we may well expect to find traces of its influence, and when we consider the difficulties of mass migrations owing to desert and drought we need not expect to find any vast influx of alien blood amongst the indigenous savages, but only the vague memories of religious teaching and language, which a few explorers and traders bore southwards from their civilised home. The peculiar physique tradition and language of the Masai-Nandi however point to an actual influx of alien blood and the most likely source of which history tells us is the Automoli of Herodotus, but even they were probably $\frac{2}{3}$ negro, so that the strain of Mediterranean blood in the Masai-Nandi is only small. Judging by the analogy of the local fauna and flora, we should expect to find the human race in this area essentially African with a few immigrants from Eurasia. Physically this appears to be the case and any theory of racial origins must be based on physical as well as linguistic and traditional evidence.

To The Editor, E. A. & U. Nat. Hist. Society.

Dear Sir,—

I wonder if you will allow me to make a few comments on Mr. Cardale Luck's paper on the "Origin of the Masai" and the authors he quotes; not with the idea of criticising its theme for I cannot pretend to Mr. Luck's patience and erudition, but to try and remove some exaggerated and even erroneous ideas about the Nandi and so-called Lumbwa.

I must give you my excuse for this request, viz.:—that I have lived 16 years almost continually amongst the Kipsigis (Lumbwa) and have been fond of wandering on foot in their Reserve and accepting

their hospitality. Having always liked and respected this people I have reached a state of intimacy which few Europeans care to with natives of East Africa and I myself would not except in the case of the Nilotic tribes, who seem to differ from the other tribes in some subtle way which one can only describe by saying that they seem more gentlemanly.

I have not made a study, in the scientific sense, of the Kipsigis; but I fancy I have considerable understanding of the mentality of the people. It is now many years since I gave up the use of Swahili entirely for I believe the only way to obtain a real understanding of any people is to speak their language every day for years.

One seems to notice a tendency in many books on Native Customs a tendency to approach them with a bias due to previous reading and the desire to and expectation of finding certain customs and certain meanings in their beliefs and customs. Frequently there are simple explanations of names and customs, etc., which should not be entirely neglected even though there may be abstruse and more exciting possible origins. Asking questions as to customs, beliefs, etc., especially in a foreign and crudely spoken language is hardly reliable. To get the nett results one must experience sympathetically the customs and beliefs as they crop up spontaneously.

Tribal Names.

The two very similar tribes known to Europeans to-day as Lumbwa and Nandi were not so long ago a single tribe calling themselves "Kipsigis" as a whole but called by the Masai "Elumbwa". The Masai on the other hand were and are still known to the Kipsigis as "Ikwopek". A little more than 100 years ago perhaps, that is in the time of the great grandfathers of the present old men, the whole tribe of Kipsigis moving Southwards across country occupied by the Masai, probably the present Uasin Gishu country, accidentally got split into two by a wedge of Uasin Gishu" (Masai) living in the Kipchoriat (Nyando) valley. One section moved westwards to the north of that valley and the other crossing the head of the valley found it occupied by Masai. They apparently halted first at a hill, 10 miles along the present Lumbwa Kericho road, which has retained the name of "Diluapsigis." "The hill of Kipsigis." Finding the Masai in strong possession of the valley they proceeded South and West ousting the Sirikwa and Kosopek (Kisii) who were in possession. It was many years before the Maasai were driven out of

* Page 169, *Natural History Journal*.

the Kipchoriat valley separating the two halves of the Kipsigis tribe and when this finally occurred, the two sections had already become somewhat differentiated, a difference which was perpetuated by the difficult nature of the Kipchoriat gorge between them.

After the separation the Northern Kipsigis began to be called "Chemngal(ek)". The reason given by old men of the Kipsigis (whose people have been in touch with the Nandi continually) is ready and simple though of course it may not be correct. At the time of the separation the elders of the section of the tribe which went North were fond of standing up on the rocks and haranguing the people (talking a lot literally) *Kikocham kotelel en goinwek barak sikomwai ngalek chechang*]

Ngaliot (singular) = word.

Ngalek (plural) = words, news, talk, conversation.

It is *very* commonly used of persons who have too much to say or as we say colloquially "hot air." And it seems to have been considered that the elders had "too much talk."

Corresponding to the Maasai word Elmegi the the Kipsigis apply the word Lemek (sing Lemindet) only to uncircumcised tribes, i.e., all the Kavirondo tribes but not to the Kikuyu and Kisii.

From their name then and their present numerical superiority it would seem that the Kipsigis (Lumbwa) are the main section of the tribe. I would suggest that there is no more reason for calling them Lumbwa than there is for calling the Maasai Ikwop, or the Jaluo Lemek. Might we not then call them by their proper name of Kipsigis. It would be very interesting if Mr. Luck could find a derivation for the word. The root "Sigis" means, Kick, but is not thought by the people to have anything to do with the proper name. If one asks why they are called Kipsigis they will reply "Why is an Elephant called an Elephant."

II. SUNWORSHIP.

It may interest Mr. Luck to know that Asis (ta)* has other names which are only used in the sense of God and not as Asista is used for the actual sun in the everyday sense. These names are "N'golo" and "Chebtalil." Their derivations I do not know (c.f. the Elephant reply above).

Mr. Luck is correct in thinking that special woods and scented ones at that were used in the sacred fire at the "Kapkorosit." Being no botanist I can only give the Kipsigis names for them.

The generic name for all plants and woods used at ceremonies is "Korosek." The one chiefly burnt at the Kapkorosit is (1)

* Pages 160-162, *Natural History Journal*.

Segejuwet (or Chegechewet), a plant about 6 ft. high with rather a climbing habit. It has bluish pink rosettes of flowers and strongly scented leaves. The sacredness of cowdung seems a little doubtful, for naturally amongst a pastoral people it is used for a great variety of domestic purposes, as also is goat and sheep dung.

The quotation from Mr. Ward's article on the "Kapkorosit" rather gives the idea that the festival is still celebrated. It is about 22 years or so since the last Kapkorosit (which used to be roughly annual and held during any month but August) was held. The occasion of its abandonment was the building of the military road from Lumbwa Station to Kericho. Possibly the people thought it was no use praying to God after that, for they say "we were scattered and families separated."

As to the orgies and debaucheries† so often referred to by Europeans, without, I think, sufficient evidence, I wish to say most emphatically that I have never been able to hear of them or find them amongst the Kipsigis. At the Kapkorosit, for example, which I take is one of the "high places" Mr. Luck refers to, cohabitation during the day and night of the festival was strictly prohibited, man and wife could not sleep together.

To say that "practically unrestricted free love exists" amongst the Kipsigis is most misleading. It is very difficult for Europeans to believe that when men and girls before initiation live freely together cohabitation is not the rule. It is nevertheless a fact that about 75% of unmarried girls are virgins. Nearly every girl has her sweetheart and sticks to him and more often than not is married to him after she comes out of the six months initiation unless he happens to be too poor and even then there are recognised ways of overcoming that impediment.

Considering again the statement that "they take particular trouble not to cover themselves before girls and unmarried women."* It had already been stated in the same paper that it is the custom of the men to go naked, *i.e.*, it is natural to them (and their womenfolk) and so the fact of nakedness is not felt by them as it is by people accustomed to be clothed. Therefore to say that they take *particular trouble not to cover themselves* is hardly appropriate. Rather does it seem to them and to those familiar with them that they take "particular trouble" to cover themselves before married women (all grown-up women are *ipso facto* married women except a few outcasts.

An example of the effect of point of view may be apropos. When the Kipsigis see for example a picture advertising gramophones of

† Page 156, *Natural History Journal*.

* Page 156, *Natural History Journal*.

men and women dancing they think it is indecent. If Victorian women saw our present day dress and behaviour or some of our illustrated papers what would they think of us, even though they are of the same race?

The Kipsigis-Nandi have faults enough without our exaggerating them.

III. THE CHEMOSIT.

Amongst the Kipsigis one finds no belief that the Chemosit is a devil or spirit or god or man. The only reference to its being like a man is that some say that at a distance it looks like a huge man because it stands up on its hind legs. Even those who say it has only one leg say that it has no arms and that its footprint is something between that of an elephant and a rhino and insist very strongly that it is only an animal. A few old men even say they have seen it at night and give descriptions—very wild ones but all quite unlike man or spirit, for they include fur, whiskers ("wawechik" = whiskers or antennae of animals and insects only). The crutch of Hollis' book is quite unknown here for they say how could an animal use a crutch. A curious detail is that the urine of the Chemosit is said to be so evil smelling that no man can stay near it. All the young men deny having seen it or knowing what it is like, but love to tell children and unsuspecting Europeans fancy tales of it.

The name Chemosit however might not be said at night just as in the case of the Chief Witch Doctor. At night it was given another name, viz., "Gononet," of which I do not know the derivation. Chemosit is a fairly common man's name and it is also used by mothers to make their children obey, *e.g.*, "If you don't eat your food the Chemosit will come and eat you."

Iletnemie and Iletneya are quite unknown to the Kipsigis. Ilet, the lightning, however, is universally and firmly believed to be a huge birdlike animal.

Yours, etc..

I. Q. ORCHARDSON.

AN ELEPHANT TRAGEDY.

M. F. R. HOCKLIFFE.

One Sunday afternoon some months ago a Forest Guard, stationed in the Aberdares a few miles above Nyeri, came to my house to tell me he had found some ivory in the forest. There was nothing very remarkable in that, but when I went outside to have a look at his find I saw to my astonishment no less than twelve elephant tusks, all laid out in a row, obviously quite recently extracted from their original owners.

This was the Forest Guard's story: While walking along a game track with his spearman somewhere near the Gura River, he noticed a number of vultures and footmarks of hyaena, all treading in one direction. Following these up he eventually came to the foot of a steep cliff which the elephant had apparently tumbled down, and there at the bottom of the cliff were six dead elephant.

It was some weeks before I got an opportunity of visiting the place, but when I did get to the scene of the tragedy I saw a sight to be remembered. About a mile upstream from the upper fishing camp on the Gura River the sides of the valley became almost precipitous, and on rounding a bend in the river, on the left bank, I came upon a broad scar about 200 feet long down the steep valley side. All vegetation that had managed to find a foothold had been torn up and swept away, leaving just the bare earth and projecting rocks. At the bottom of the avalanche under a mass of rocks and torn-up tree growth were the carcasses of three elephant, lying a few yards apart. A fourth lay about a hundred yards away, and about a quarter of a mile farther on, in different directions, were the carcasses of two more.

After some difficulty a Forest Guard and I managed to find a way up the bank. The first few yards of the elephant's fall were absolutely precipitous and we had to find a way round. The rest of the way up was very steep and most unpleasant going, as loose rocks and small avalanches of earth kept on tumbling down, and there was very little foot or hand hold. Eventually we came to a game track running along a contour from where the elephant had begun their fatal descent. As far as we could see there were no signs of any fighting or disturbance on the track, and though the spoor was some weeks old by then, it did not look as if two herds coming in opposite directions had met. It was evident that the track had not given way at that point as there it was perfectly intact. The only conclusion we could come to was that for some reason or other the elephant had walked down feeding off the track, the earth had immediately given way, they had been unable to recover themselves, and the whole lot

shot to the bottom. Possibly something may have scared them, Wanderobo or lion.

Down in the valley the tale was quite plain. Four of the elephant had been killed almost outright, while two had managed to stagger about a quarter of a mile before succumbing to their injuries. But one of the most remarkable things of the whole affair was that, in spite of the fall and the number of rocks the elephant must have hit up against, not a single tusk was even chipped.

They were all young bulls with very small tusks, in fact the smallest tusk weighed a pound and a half. However, the Forest Guard who claimed the find got a very nice little reward from the District Commissioner.

The East Africa and Uganda Natural History Society.

1926.

RECEIPTS.

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|-----------------------------|----------|
| By Balance at Bank 31/12/25 | 236 60 |
| Cash on hand | 13 90 |
| Subscriptions 1926 | 5,023 67 |
| Entrance fees | 330 00 |
| Subscriptions 1925 | 120 00 |
| Sale of Journals | 524 40 |
| Visitors to Museum | 541 00 |
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| Government Grant | 6,000 00 |
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EXPENDITURE.

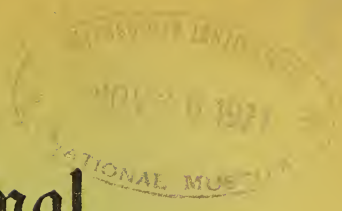
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| To Upkeep and General Expenses | 291 65 |
| Cost of Journals | 5,392 75 |
| Wages | 280 00 |
| Exchange on cheques | 11 95 |
| Rent of Plot | 60 00 |
| Light | 38 00 |
| Insurance | 140 50 |
| Solicitors Fees | 26 00 |
| Refund of subscriptions | 90 00 |
| Hire of Chairs | 50 00 |
| Returned Cheques | 10 00 |
| Stamps, letters, journal, receipts | 97 00 |
| Duty on Cabinet | 340 00 |
| Furniture, Government Grant | 6,000 00 |
| Balance at Bank 31/12/26 | 460 89 |
| Cash on hand | 00 83 |
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The Journal

OF THE

EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

April, 1927.

No. 29.

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EDITOR OF JOURNAL:
Dr. V. G. L. van Someren.

Additional copies to members, Shs. 5/-; to non-members, Shs. 10/-.

(Date of publication, October, 1927.)

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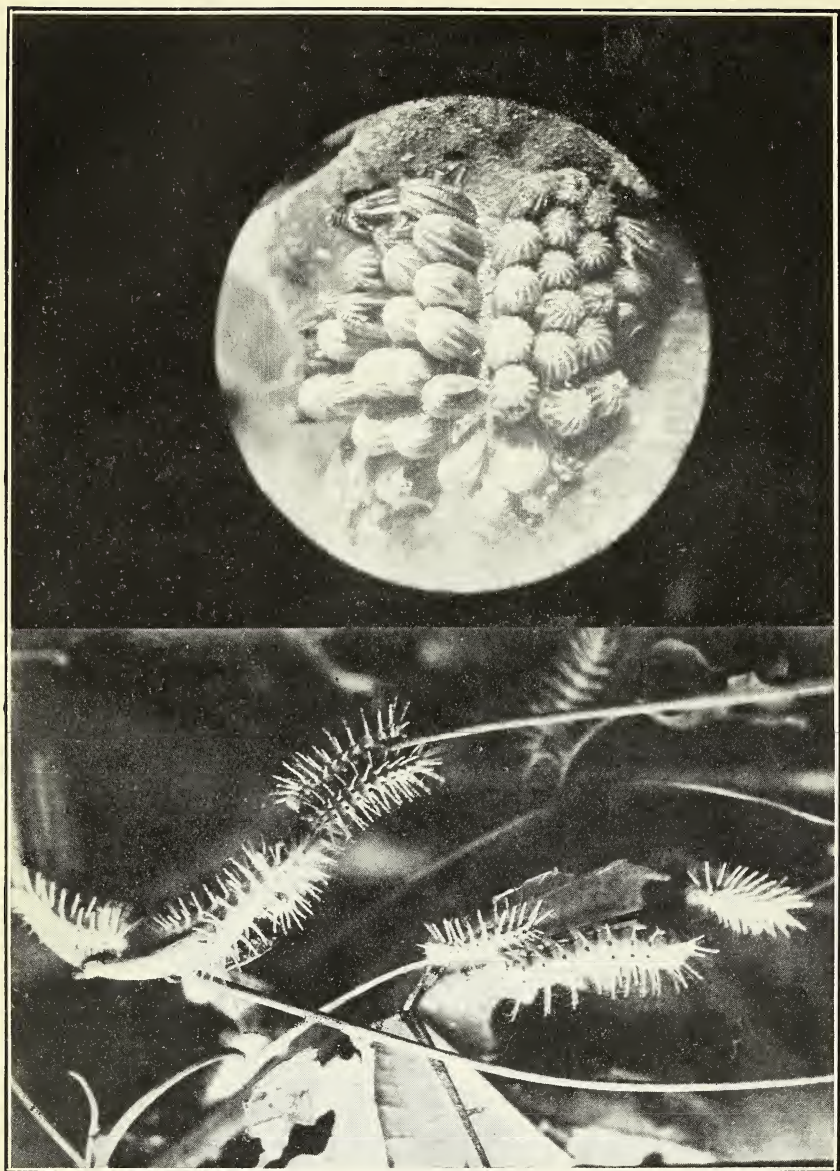
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FRONTISPIECE.



A

B

Photos by DR. VAN SOMEREN.

- A. Eggs of *Planema quadricolor leptis*.
- B. Larvæ of *Planema quadricolor leptis*.

THE BUTTERFLIES OF KENYA AND UGANDA.

By

V. G. L. VAN SOMEREN, F.E.S., F.L.S., etc.,

and

REV. K. ST. A. ROGERS, M.A., F.E.S.

PART V.

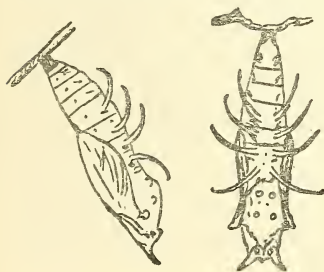
SUB-FAMILY *ACRÆINÆ*.

GENUS *PLANEMA*, Dbl. & Hew.

INTRODUCTION.

Representatives of the genus *Planema* are to be distinguished from *Acræa*, by the colour of the Palps, which are black with a lateral grey or white line, and by the position of the first branch of the subcostal or 11th vein; this is given off, at or beyond the apex of the cell. The hind-wing cell is usually much smaller than in *Acræa*.

The larvæ of the two genera are not markedly different, but those of *Planema* usually have much longer branched spines and on the whole are less particoloured.



PUPÆ OF *PLANEMA*

The pupæ are distinguishable however; those of *Planema* always have long dorsal spines which are hooked at the end, but the body of the pupa is not heavily ornamented with dark markings.

Most of the representatives of this genus are conspicuously coloured, many having a general superficial resemblance to each other. All are credited with a high degree of distastefulness to enemies, and as a result quite a number are mimicked by species of other genera and families. Some of the most wonderful examples of mimicry are to be found between species of *Planema* and the *Nymphalids*, *Pseudacraea*; examples are given later.

PLANEMA POGGEI NELSONI, Smth. & Kirby, Pl. XXXV., figs. 1 and 4. Pl. XL. fig. 4.

Expanse: Male 70-80 mm., female 80-90 mm. General colour in both sexes, black, orange and white.

F.-w base and apex black with an intervening orange band 8-10 mm. wide, extending from the costa, at apex of the cell, obliquely across the wing to just short of the hind-angle. On the inner margin the orange is carried somewhat inwards in 1 and 1a and reaches the hind border; there is an invasion of the orange band, by the black ground at the base of 3, usually in the form of a round spot; there is also an indentation on vein 2. The outer margin is slightly indented internervularly, especially in areas 1b, 2 and 3.

H.-w blackish with a somewhat well-defined white triangular band, base to inner margin, apex to costa, with the distal edge slightly angled and following the contour of the wing.

FEMALE:

Similar to the male but larger and with more rounded wings, and wider bands.

EARLY STAGES:

The eggs of this species hardly differ from others of this group, being a long ovoid, prominently ribbed and transversely ridged. They are cream coloured when first laid but turn a rich yellow after about two days. They are laid on a species of *Vitis*, order *Ampelidaceæ*. The egg stage lasts a week. The young larvæ are at first greyish, and feed within an hour of emerging. They are gregarious. At the second moult they become an olive green with prominent spines. The colour becomes a pale bluish green in the last stage and the branched spines measure 4-6 mm. in length. There are orange or yellow dots along the spiracular line and between each spine. The pupa is typically *acraïne*, long and slender, pale greenish, with black lines on the wing cases and head, and around the cremaster. The head carries longish lateral horns, while the 1st to 4th, abdominal segments are ornamented dorso-laterally with long spines which are curved at the tip. Anterior to each spine is an oblique black line and such are present on each of the remaining segments, and duplicated on the penultimate one. The thorax is ornamented with two pairs of blunt spines and each wing case has a recurved spine at the base. The pupal stage lasts 14 to 18 days, varying with temperature and humidity.

DISTRIBUTION:

Occurs throughout Uganda and extends eastwards to the Nandi-Elgon area. It is particularly plentiful in the central province of Uganda and around Jinja in the eastern province.



Photo by DR. VAN SOMEREN.

Plate XXXV.

- Fig. 1. *Planema poggei nelsoni*, male.
- Fig. 2. *Planema macarista*, male.
- Fig. 3. *Planema macaria hemileuca*, male.

- Fig. 4. *Planema poggei nelsoni*, female.
- Fig. 5. *Planema macarista*, female.
- Fig. 6. *Planema macaria hemileuca*, female.

OBSERVATIONS :

Judging from the numbers captured or seen, it would appear to be the commonest species of the tri-coloured group, but there is a distinct seasonal incidence. (See Carpenter, *Trans. Ent. Soc.*, 1923, pts. III., IV., Jan. 24, pp. 469-489.) Its influence on the mimetic species is most marked.

In the Eastern limits of its distribution, there would appear to be a tendency to persistence of the fore-wing pattern of the parent form *poggei poggei*, Dew., i.e., there is a marked increase in the width of the fore-wing band with a reduction in that of the hind-wing; the hind-wing band is frequently tinged ochreous. Besides four specimens of this type taken in the Nandi-Kaimosi area there are two in the Hope Dept., Oxford, from Eastern Uganda. A series of *poggei* from the eastern limits might shew this form to be constant. Pl. XXXVIII., fig. 1.

PLANEMA MACARISTA, Sharpe. Pl. XXXV., figs. 2 and 5. Pl. XXXIX., figs. 1 and 5.

MALE :

Expanse 84-90 mm. General colour blackish with orange and white bars. Sexes different.

F.-w. Sepia-blackish with an orange-yellow bar extending from the costa to the hind margin of the wing. The inner border of this band starts at the origin of vein 11, passes obliquely down along the apex of the cell, avoids the base of 3, thence cuts the base of 2 almost vertically, passing down with a slight outward curve to the hind margin. In a "set" insect this border is almost vertical, with a rounded indentation at the base of 3. The outer edge commences at vein 12, passes obliquely to the mid point on 4, thence by zigzags to the hind angle. The width of the band varies slightly in individuals but the general outline is fairly constant.

H.-w. Sepia-black, with a somewhat triangular white patch, base to inner margin, apex to upper angle, sharply defined from the blackish base of the wing but rather diffuse distally, being indented by the blackish internervular rays. A variable number of black spots show through the base from the underside.

Underside: F.-w. pattern as above, but duller; an orange spot distally edged with black is present at the base of the costa. H.-w. general pattern similar to above but basal triangle chestnut with clearly defined black spots as follows: One each in 8 and 9; two large, basal in 7; one each at base of 2, 4, 5, 6; two each towards base of 1a and 1c; three in cell, one large central, one at base, one at origin of vein 5.

FEMALE:

F.-w. sepia black with an oblique white bar extending from the costa outwards to the hind angle, and just reaching 1b. The inner edge follows a curve from the mid-point on costa to the origin of vein 4, thence with a more graduated curve to the mid-point on 2. The outer margin follows the oblique line of the discocellulars thence outward and downward to almost the end of 2, the line being serrated intercellularly.

H.-w. as in the male but white bar narrower, less triangular; marginal border much wider.

Underside: A dull replica of above, with the base of the hind-wing dull chestnut, spotted with black as in the male.

EARLY STAGES:

The eggs are of the usual *acraeina* type, white or creamy with a high glaze; long oval, slightly flattened at the base, well ribbed and cross-banded. We have not reared the larvæ nor can we find a published description of the various instars.

DISTRIBUTION:

Uganda, more particularly the western and central, area extending to the Nile and more rarely eastward to South Elgon and the Teriki country.

OBSERVATIONS:

This is almost entirely a forest species. The seasonal incidence has been studied by Carpenter, op. cit., and its position in the mimetic association centred round *P. poggei* investigated. The male shews a close resemblance to *P. poggei*, *macaria hemileuca*, and *P. elgonense*; while the female follows the colouration of females of *macaria hemileuca*, *alcinoe camarunica*, *elgonense* and *aganice montana*. Both male and female act as models for *Pseudacræa eurytus*, and female forms of *Papilio dardanus*.

A certain number of males have the median bar of the hind-wing tinged with rufous var. *mofosa*, Suff., and *vendita*, Grunb., thus approaching the colouration of the rare *Pl. pseudeuryta*.

PLANEMA MACARIA HEMILEUCA, Jordan. Pl. XXXV., figs. 3 and 6. Pl. XXXIX., figs. 4 and 8.

MALE:

Expanse 76-82 mm. General colour blackish, orange and white.

F.-w very like *macarista*, but the tawny orange bar, though wider at the costa, is generally narrower, more serrated on the outer margin and more irregular on the inner. The orange colour extends into the

apex of the cell and this projection carries a characteristic black spot at the origin of 5.

H.-w. very much like that of *macarista*, but the basal area is browner with more clearly defined black spots; the marginal sepia is less dense though the internervular rays are well marked; the area thus appears larger and less sharply defined distally.

Underside: F.-w. pattern as above but colour duller. A black and yellow spot is present at the base of the costa.

H.-w. basal area chestnut, bearing black spots as follows: One each at base of 8, 5, 4, and 2; two basally in 7; one large or two small basal in 1c; two each at base of 1a and 1b. Cell with three spots. The sepia margin is ill defined.

FEMALE:

Expanse 98-100 mm. General colour black and white.

F.-w.: Base, from line of apex of cell to almost the hind angle, black. The cell with a conspicuous white spot towards the apex. Distal margin of white bar runs obliquely from costa through the discocellular veins thence curving downwards and slightly inwards passes towards the hind angle, the contour being deeply indented in 1b and 2. The inner margin passes through the apex of the cell thence slightly inwards in 2. passes abruptly outward in 1a and 1b, thus narrowing the band markedly.

H.-w. basal area dark brown with black spots as underneath. A broad white band, widest at the inner margin passes obliquely across the wing, sharply differentiated from the basal brown but not sharply defined distally.

UNDERSIDE:

F.-w. as above though duller and without the white spot in the cell. H.-w. pattern as above; basal area chestnut carrying spots as follows: one each basal in 8, 6, 5, 4, and 2; two each at bases of 1a, 1b, 1c and 7. Cell with three spots, one at base, one at midpoint, one distal.

EARLY STAGES:

Unknown.

DISTRIBUTION:

A rare insect which has been recorded from Uganda at Mawakota, Entebbe, and Jinja.

OBSERVATIONS:

The male figured differs slightly from the type but is uniform with other specimens taken in Uganda. The female we believe has not been described hitherto. The mimetic relationship is similar to

the preceding species, both male and female acting as secondary models for *Pseudacræa eurytus*.

PLANEMA ELGONENSE, Poulton. Pl. XXXVI.. figs. 2 and 5.
Pl. XXXIX., figs. 2 and 6.

MALE:

Expanse 70-76 mm. General colour black, orange and white.

F.-w.: Apical portion extended; distal margin curved as in *macarista*; basal and apical portion blackish; separated by a much curved tawny orange band with deeply serrated outer margin. The distal margin is very like that found in *macarista* but the inner margin is strongly curved outward to the mid point on 2 thence turning inward sharply at almost right-angles reaching the hind margin of the wing at the proximal end of the terminal third of 1a.

H.-w. blackish with a wide white band the upper margin of which is sharply defined from the black basal area, and on the lower edge clearly separated from the black marginal border, thus differing in this respect from *macarista*. The lower edge is furthermore, not straight, but somewhat angled outwardly in 4.

FEMALE:

Expanse 70-74 mm. general colour black and white.

F.-w. broader and more rounded than in the male, but with a white band of similar outline though broader.

H.-w. similar to that of the male, but broader.

UNDERSIDE:

Male and female, dull replicas of above, but with the base of the hindwing rich purply-chestnut, carrying spots as follows: One very minute in 8; two large transverse in 7; one each at base of 6, 5, 4, and 2, the latter two very small; two each in 1a, 1b; three in 1c; cell with three large spots, the centre one transverse to the long axis.

EARLY STAGES:

Unknown.

DISTRIBUTION:

A rare insect, occurring only in the West Elgon district of Uganda.

OBSERVATIONS:

This species has recently been described by Prof. Poulton who has kindly ascertained its relationship to allied Planemas; "closely allied to *poggei*, Dew., and *adrasta*, Weym., but in both sexes bearing a strong resemblance to *macarista*, Sharpe, *macaria hemileuca*, Jord., also, in the female, to the female of *alcinoa camerunica*, Auriv., in

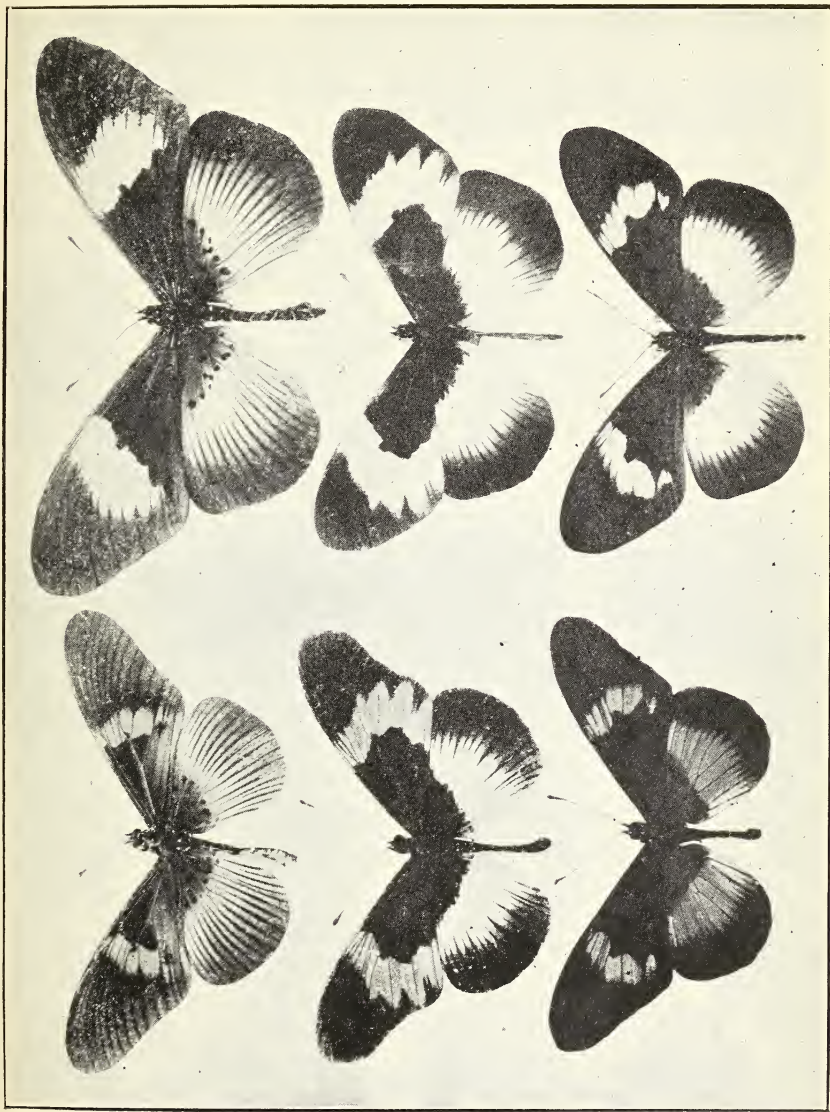


Photo by DR. VAN SOMEREN.

Plate XXXVI.

Fig. 1. *Planema alcinoe camarunica*, male.

Fig. 2. *Planema elgonense*, male.

Fig. 3. *Planema aganice montana*, male. Uganda race.

Fig. 4. *Planema alcinoe camarunica*, female.

Fig. 5. *Planema elgonense*, female.

Fig. 6. *Planema aganice montana*, female. Uganda race.

the male to the *aurivillii*, Staud., female of *Acræa alciope*, Hew.”
. . . . In size this new form was a rather small member of this
Planema association . . .” “ the true relationship of this new
species was kindly determined by Dr. Eltringham, who examined the
male armature and found that it closely resembled that of *poggei*
poggei, *p. nelsoni*, and *adrasta*, being of a much smaller and much
simpler type than in *macarista* and its two associates, which differed
markedly from each other as well as from the species described, and
other members of the *poggei* group.” The species is only known from
three male and two female specimens taken in the West Elgon
district.

PLANEMA ALCINOE CAMARUNICA, Auriv. Pl. XXXVI., figs.
1 and 4. Pl. XXXIX., figs. 3 and 7.

MALE :

Expanse 68-80 mm. General colour blackish and orange-brown.

F.-w. : Apical half blackish brown, basal area tawny-orange
bordered distally with an orange bar which crosses the wing from
costa to just inside the hind margin. Sub-costal area, distal end of
cell and base of area 2 with diffuse blackish scaling; in some specimens
a blackish spot at base of 3, and one in 1b at the junction of distal
and mid third.

H.-w. : Basal area tawny orange merging into a lighter diffuse
band which shades into a broad brownish marginal border with darker
rays and internervular streaks. The basal area is spotted with
blackish-brown marks which correspond to the spotting beneath.

UNDERSIDE :

A dull replica of upper surface with a lighter brown shade distally
on both wings. Basal triangle of hind-wing chestnut ornamented
with black spots as follows: One in 8; two each in 7, 4, 1a, 1b, and
1c. sub-basal; one each sub-basal in 2, 5, and 6; two in the cell, basal
and central, the latter transverse to the long axis.

FEMALE :

General colour black and white.

F.-w. basal half of wing dark rusty-brown, shading into black
distally. Apical area black, separated from the basal black by a broad
oblique white band, the inner margin of which is invaded by the
ground colour at base of 3, and distal two-thirds of 1b.

The outer margin is somewhat curved and indented by the black
ground in 2 and 3.

H.-w. : Basal triangle rusty brown, decorated with black spots.
Marginal border blackish and broad, separated from the base by a

diffuse white band, widest at the inner margin of the wing and tapering towards the costa; strongly invaded distally by blackish rays and internervular streaks.

UNDERSIDE:

Very like above but duller. A white spot, distally bordered with black is present at the base of the costa. Basal triangle of hind-wing chestnut with black spots arranged as follows: One in 8; one each in 1a, 1b, 5 and 6, sub-basally; one each, basal in 2 and 4; two each in 1c and 7, basal and sub-basal; three in the cell, one sub-basal, a double spot at mid-point, and a double spot at origin of vein 5.

EARLY STAGES:

Unknown to us personally, but described in Seitz, p. 241, as follows: Larva light coloured with black markings on the upperside of the abdomen on each segment from 2-5 with a pair of very long, slender, black spines with yellow-red bases and the tips curved into hooks; those of the second segment are longer than the rest and directed forwards; those of the fifth segment shortest; the head with two divaricating horns.

DISTRIBUTION:

Occurs through Uganda, extending east to Teriki, but rare to eastward; it is essentially a western species.

OBSERVATIONS:

Dr. Carpenter (1c) has raised an interesting point in connection with the possible influence of *Planema aganice montana* on the colouration of this species. There is an undoubted tendency for the eastern *alcinoe* to become darker at the base of the fore-wing. The female *alcinoe* acts as a model for the *tirikensis* form of *Pseudacraea eurytus*.

PLANEMA AGANICA MONTANA, Btlr. Pl. XXXVI., figs. 3 and 6.
Pl. XL., fig. 9.

MALE:

Expanse varying from 56-70 mm. General colour blackish and orange.

F.-w. sepia black with a narrow curved orange tawny bar which passes from the costa through the basal third of the discocellulars thence through the basal half of 5 except for the extreme base, through the mid-third of 2, followed by an isolated triangular spot in 1b, set slightly internal, and cut off by a projection of the black scaling invading the yellow of 2.

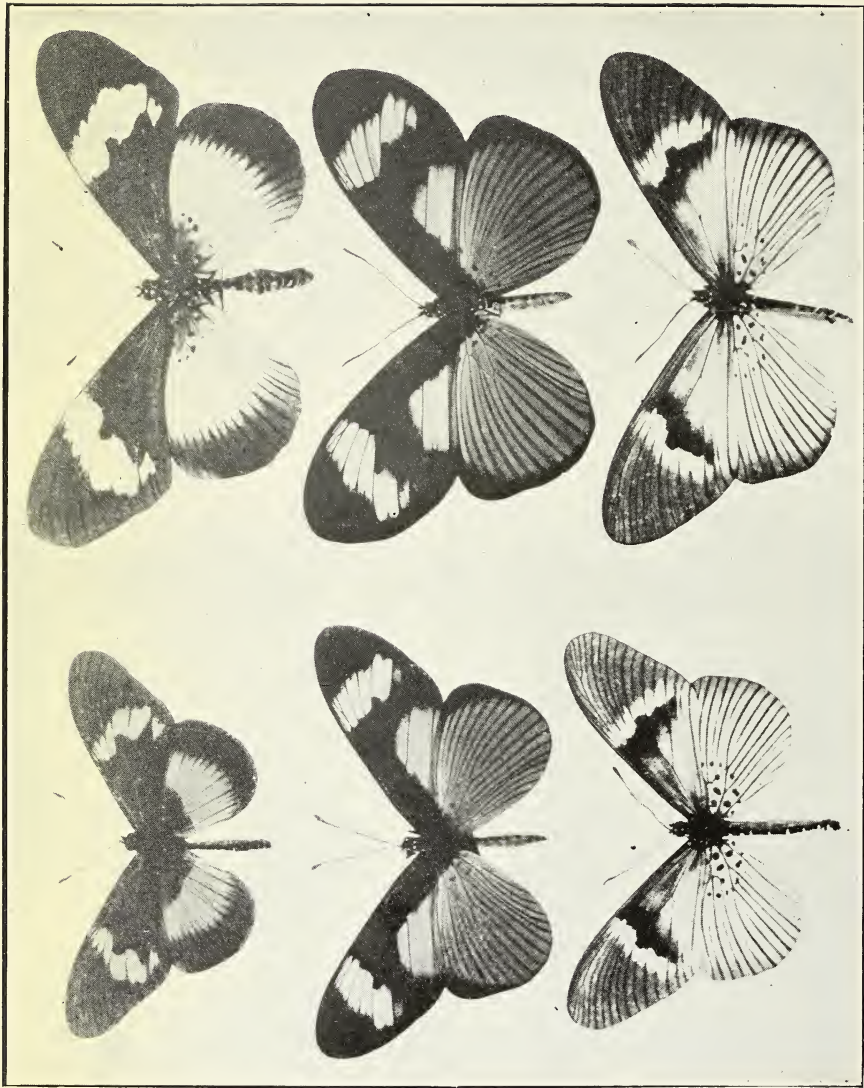


Photo by DR. VAN SOMEREN.

Plate XXXVII.

- Fig. 1. *Planema aganice montana*, male. Kenya race.
Fig. 2. *Planema tellus eumelis*, male.
Fig. 3. *Planema consanguinea albicolor*, male.
Fig. 4. *Planema aganice montana*, female, Kenya race.
Fig. 5. *Planema tellus eumelis*, female.
Fig. 6. *Planema consanguinea albicolor*, female.

H.-w. with a broad orange centre, proximally bordered by a blackish-brown basal patch and distally by a clear-cut marginal blackish border 5-6 mm. in width. There are a few indistinct blackish spots on the basal triangle.

UNDERSIDE :

Pattern as above, but dark areas more brownish, except for the base of the hind-wing. This is a reddish-chestnut carrying black spots of variable size and number; average as follows: Usually a small one in 8; two large ones in 7; one each in 5 and 6; three in 1c, the distal one transverse; two each in 1a and 1b. The cell contains one, sub-basally, and a curved line distally or sometimes this line is represented by two distinct spots.

FEMALE :

Expanse 75-80 mm. General colour black and white. Resembles the male in pattern but the light areas are white.

EARLY STAGES :

The eggs are laid in groups on the under surface of the leaves of a creeper *Adenia cissampeloides*, Harms (*Passifloraceæ*). They are similar to those of other planemas. The larvæ go from a dull greyish green of the first stage to a pale green, each segment with the exception of the first thoracic and the anal, armed with six long branched spines of a yellow or yellowish green colour; the base of each spine is bluish, while the intervening spaces in the line of the spines carry blue spots; head brownish. The pupa is of the usual type, *i.e.*, rather elongate about 25 mm. with lateral spikes to the head segment, and on the dorsum of each of the abdominal segments 1-5 long reddish brown curved spines, the first pair directed forwards, the rest backwards.

DISTRIBUTION :

The description given applies to the race of *aganice* which is found in Uganda, east to Nandi and Londiani.

OBSERVATIONS :

In this race the males and females are much darker than those of Kenya; especially is this noticeable in the basal triangle of the hind wing. Furthermore, the white band in the hind wing of the female is narrower, while the marginal border is darker and more sharply defined.

PLANEMA AGANICE MONTANA, Kenya race. Pl. XXXVII.,
figs. 1 and 4. Pl. XL., fig. 8.

MALE :

Expanse 56-60 mm. General colour dark brownish and tawny orange. The pattern of this race conforms to the description given

for that of Uganda, but the dark areas are not so dense—much more brownish—with in the fore-wing a decided paling toward the base; the hind-wing basal triangle is rusty brown with clear black spots; the marginal border is narrower.

FEMALE :

Expanse 80-90 m.m. General colour dark brownish and white.

F.-w. pattern as in the Uganda form but dark areas considerably paler especially at the base, with a concentration of scaling around the white bar.

H.-w. basal area pale ochreous brown ill defined distally and clearly spotted. White area extensive not very sharply defined from grey-brown marginal border; interneural streaks marked.

UNDERSIDE :

Pattern as above but dark areas with an ochreous tinge.

EARLY STAGES :

As in the Uganda form. It feeds on *Tryphostemma zanzibaricum*, Mast (*Passifloraceæ*).

DISTRIBUTION :

This pale form ranges from the coast zone to Kilimanjaro and Teita northward to Mt. Kenia and Nairobi and sparingly to the Mau.

OBSERVATIONS :

There is not the slightest doubt but that there are two distinct geographical races of *P. aganice* inhabiting Kenya and Uganda. Quite a number of Kenya examples (females) have buffy areas in the hind-wings; especially is this the case in the Taveta district, and often in the Nairobi area.*

PLANEMA PSEUDEURYTA, G. & S. (not figured).

This is a rare insect of which only the male is known. It is very like *macarista*, but the inner margin of the fore-wing orange bar is outwardly curved, and the hind-wing pale area is orange-brown.

EARLY STAGES :

Unknown.

DISTRIBUTION :

Appears to be confined to western Uganda from whence two examples were taken by Neave at Toro.

* I have on occasion at a distance mistaken a large female with buff hind-wing for a pale var. of *Papilio d. cenea* or *Amauris d. damocles*.

OBSERVATIONS :

Carpenter has pointed out, Op. cit. that this *Planema* is probably the model for the *opisthozantha* form of *Pseudacraea eurytus*.

PLANEMA TELLUS EUMELIS, Jordan. Pl. XXXVII., figs. 2 and 5. Pl. XL., figs. 5.

MALE :

Expanse 68-72 mm. General colour orange and black.

F.-w. blackish-brown with an orange bar crossing the wing from immediately below the costa to the distal end of cellule 2, but not reaching the margin, and placed between the end of the cell and the proximal end of the internervular rays. Hind margin with a large orange area occupying the basal two-thirds of cellule 1a and 1b, and the inner half of 2.

H.-w. mostly orange, with a small blackish area at the base, and a narrow blackish marginal border, widest at the apex and decreasing rapidly towards the anal angle. The veins and internervular rays are blackish and well marked, and extend inward almost to the cell.

UNDERSIDE :

F.-w. somewhat like above but with the apical area ochreous with black lines. A white streak is present at the base of the costa.

H.-w. ochreous with black spots at the base, but no marginal border. Veins and internervular rays black as above.

FEMALE :

Expanse, 80-90 mm. Very like the male, but larger and with more rounded wings. The lower half of the fore-wing orange band is more irregular.

EARLY STAGES :

Unknown to us.

DISTRIBUTION :

Throughout Uganda but not plentiful in the east.

OBSERVATIONS :

This *Planema* is the model for the *terra* form of *Pseudacraea eurytus*. It is to be noted that there is no brown or chestnut at the base of the hind-wing below, neither is this present in the mimic.

A certain number of specimens have the fore-wing bar very pale to almost white, thus approaching a similar form of *Acraea jodutta*. Such a form is also met with in *Ps. eurytus*.

PLANEMA CONSANGUINEA ALBICOLOR, Karsch. Pl. XXXVII.,
figs. 3 and 6. Pl. XL., fig. 6.

Expanse, male and female, 60-65, 78-80 mm. Sexes alike.

General colour buffy with greyish-brown tips to fore wings.

F.-w. basal half buffy white to pale sandy shaded in the upper part of the cell with greyish brown; apical half greyish brown darkest proximally, with a narrow white or creamy oblique bar which is sub-basal between veins 4-7, narrowest in cellule 3, passes through cellule 2, slightly distal to the mid-point and represented in 1b by a free spot.

H.-w. almost entirely sandy buff with a dark marginal border, widest in 4-7, decreasing towards the anal angle. Veins and inter-neural rays greyish-brown, well defined and reaching almost to the cell. Basal area with a variable number of dark spots.

UNDERSIDE:

Apical portion of fore-wing and whole of hind-wing ochreous buff with dark rays; white forewing bar present and accentuated by dark scaling proximally. Two black spots at base of f.-w. costa; basal spotting of hind-wing variable but clear, usually as follows: One in 8; two in 7; one each, sub-basal in 6, 5, 4, 2, 1a and 1b; three in 1c; two in the cell.

EARLY STAGES:

Unknown.

DISTRIBUTION:

Western Uganda to Central Province; common on Bugalla. Not present in Kenya.

OBSERVATIONS:

This species has a restricted distribution, and, so far as we know, has no close mimics, though the colouration is distinctive.

PLANEMA EPAÆ PARAGEA, Sm. Pl. XXXVIII., figs. 2, 3, 4.
Pl. XL., fig. 1.

MALE:

Expanse 66-70 mm. Female 75-82 mm. General colour sooty greyish brown with creamy markings.

F.-w. sooty grey—with brownish tinge; a row of three creamy or white spots at the proximal end of the mid-third of veins 5, 6, and 7, followed by one or two spots slightly beyond the mid-point of cellule 3. There is usually a certain amount of creamy scaling towards the base of cellule 2, also at mid-point of 1b.

H.-w. sooty grey with an indistinct creamy band which passes across the wing through the apex of the cell.

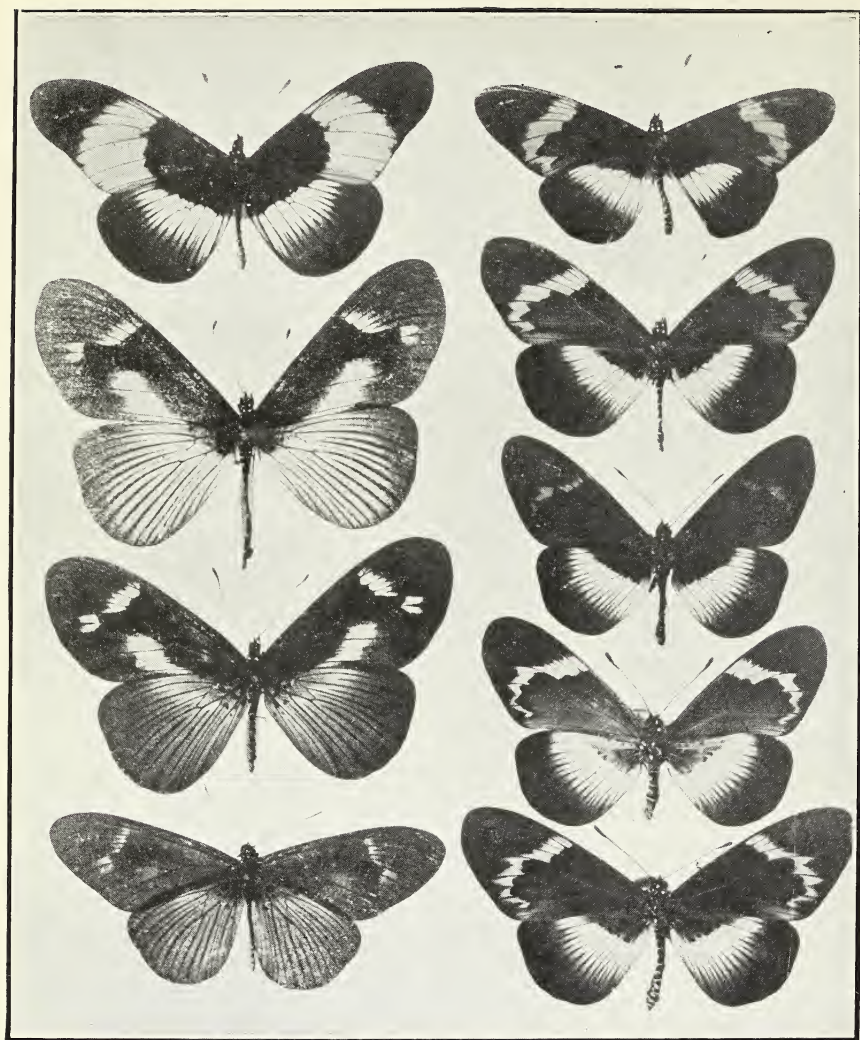


Photo by DR. VAN SOMEREN.

Plate XXXVIII.

- Fig. 1. *Planema poggei* var. Fig. 5. *Planema quadricolor latifasciata*, male.
 Fig. 2. *Planema epæa paragea*, female. Fig. 6. *Planema quadricolor latifasciata*, female.
 Fig. 3. *Planema epæa paragea*, female. Fig. 7. *Planema quadricolor leptis*, male.
 Fig. 4. *Planema epæa paragea*, male. Figs. 8, 9. *Planema quadricolor leptis*, female vars.



Photo by DR. VAN SOMEREN.

Plate XXXIX.

Undersurfaces.

- | | |
|---|---|
| Fig. 1. <i>Planema macarista</i> , male. | Fig. 5. <i>Planema macarista</i> , female. |
| Fig. 2. <i>Planema elgonense</i> , male. | Fig. 6. <i>Planema elgonense</i> , female. |
| Fig. 3. <i>Planema alcinoe camarunica</i> , male. | Fig. 7. <i>Planema alcinoe camarunica</i> , female. |
| Fig. 4. <i>Planema macaria hemileuca</i> , male. | Fig. 8. <i>Planema macaria hemileuca</i> , female. |

UNDERSIDE :

F.-w. much like above but apical portion tinged with ochreous. H.-w. ochreous grey, slightly paler in the region of the band, and orange tawny at the base; this last with clear black spots, variable in number. The veins and internervular rays are greyish-brown.

Certain male specimens are almost uniform sooty-grey on the upperside, vide Pl. XXXVIII., fig. 4.

FEMALE :

Very like the male but larger and generally darker, but with the creamy markings more distinct in the fore-wing and usually so, in the hind-wing, but very frequently the hind-wing pale area is wide spread and diffuse. Pl. XXXVIII., fig. 2.

EARLY STAGES :

We can find no record of the eggs and larvæ of this species. The pupa is a pale bluish-green with black lines on the wing scutæ, linnea markings along the lateral aspect of the abdominal segments, anterior to the long spines. The spines are present on the 1st to 4th segments; red at the base, yellow centrally and black tipped.

DISTRIBUTION :

This species occurs in Uganda but to our knowledge does not extend into Kenya.

OBSERVATIONS :

This *Planema* is the model of the *obscura* form of *Pseudacraea eurytus*, also of the predominant form of female of *Papilio cynorta peculiaris*, Neave, while certain forms of *Acraea lycoa* and *johnstoni* would certainly come within this combination.

PLANEMA QUADRICOLOR LATIFASCIATA, Sharpe. Pl. XXXVII., figs. 5 and 6. Pl. XL., fig. 3.

Expanse, males 50-55, females 68-70 mm. General colour black, reddish-chestnut and orange. Sexes almost alike.

F.-w. basal half reddish chestnut separated from the black apical portion by an oblique orange band which extends from the costa to almost the hind angle near which point the band narrows and curves inwards; the inner margin of this band is accentuated with a narrow black line.

H.-w. basal triangle reddish-chestnut followed by an ochreous-orange band about 4-6 mm. wide; the rest of the rest of the wing dark blackish-brown.

UNDERSIDE :

Very like above but duller, the dark areas being brownish and the hind-wing band paler; the basal triangle however richer, and ornamented with black spots.

Female like the male but larger.

EARLY STAGES :

The eggs are laid in a group on the under side of the leaves of a creeper *Adenia cissampeloides*, Harms (*Passifloraceæ*). They are white to cream and in shape indistinguishable from those of *quadricolor leptis*.

The larva changes from a dirty greyish-green of the first two instars to a translucent bluish green, paler at the first three segments. The segmental spines are long, greenish at the base and black-tipped. The spaces between the spines are ornamented with bluish spots. The pupa is pale bluish or greenish, typically acraëine, with lateral spines on the head and long dorsolateral spines to the first four abdominal segments. In some specimens these spines are reddish.

DISTRIBUTION :

This race occurs in the Elgon Kavirondo districts and on the western Mau.

OBSERVATIONS :

Although a common and distinctively marked insect, it appears to have influenced very few plastic species; there are however certain forms of *Pseudacraea dolomena*, and *Acraea johnstoni* which bear a superficial resemblance to it.

PLANEMA QUADRICOLOR LEPTIS, Jordan. Pl. XXXVIII., figs. 7, 8, and 9. Pl. XL., fig. 2.

MALE :

Expanse 50-60 mm. General colour reddish-chestnut, black and white.

F.-w. basal half of wing bright reddish-chestnut; apical half deep brownish-black, with almost at the proximal edge, a narrow orange band of about equal width throughout, in cellules 4-7, slightly expanded and more distally placed in 3 and represented in 2 by a crescentic or angular mark which extends slightly into 1b.

H.-w. basal patch reddish-chestnut, separated from the blackish marginal border by a white bar, sharply defined proximally but shaded distally.

UNDERSIDE :

As above but black areas more brownish; the basal area in hind-wing brighter reddish.



Photo by DR. VAN SOMEREN.

Plate XL.

Undersurfaces.

- | | |
|--|---|
| Fig. 1. <i>Planema epæa paragea.</i> | Fig. 5. <i>Planema tellus eumelis.</i> |
| Fig. 2. <i>Planema quadricolor leptis.</i> | Fig. 6. <i>Planema consanguinea albicolor.</i> |
| Fig. 3. <i>Planema quadricolor latifasciata.</i> | Fig. 7. <i>Planema aganica montana,</i> Uganda race. |
| Fig. 4. <i>Planema poggei nelsoni.</i> | Fig. 8. <i>Planema aganica montana,</i> Kenya race. |
| | Fig. 9. <i>Planema a. montana,</i> Uganda race. |

FEMALE :

Very like the male but reddish areas paler, more brownish; and the fore-wing orange bar wider and paler. Expanse 60-75 mm.

EARLY STAGES :

Almost identical with the race *latifasciata*. The eggs are laid in one or more groups on the underside of the leaves of a creeper *Adenia cissampeloides*, Harms. They are ovoid, slightly flattened at the bases with a slight depression at the top, markedly ribbed and cross-ridged. In colour creamy to yellow. The newly emerged larva is greyish-brown with a black head and minute tubercles on each segment. At the first moult it becomes greyish green, changing to a pale bluish-green at the next instar. The mature larva is a very pale bluish green, some almost white, each segment, with the exception of the 1st thoracic and anal, ornamented with six long branched spines, pale green at the base and bluish at the tip, with between each, a reddish spot, duplicated centro-dorsally. Head ochreous. The larval stage lasts two to three weeks varying with the condition of the food plant and humidity.

The pupa is pale bluish-green with a whitish pubescence, with black marks on the cremaster and wing covers, oblique black lines on the dorso-lateral aspect of the abdominal segments in front of each spine, with a double mark on the pen-ultimate segment. The spines are present on the 1st to 4th segments; they are greenish at the base centrally red and black-tipped; the anterior pair directed forwards the remainder backwards. In some examples the spines are entirely red while the body is immaculate. The pupal stage lasts ten days to a fortnight. The head spines are well developed and divergent.

DISTRIBUTION :

This race is found in the highland forests of Kenia, being especially plentiful on the slopes of Mt. Kenia, the Kikuyu Escarpment and on the Aberdares. We have also taken it at Molo.

OBSERVATIONS :

This race is remarkably constant in pattern and colour. There is an interesting point however in connection with the veination; the position of the first branch of the fore-wing sub-costal which in the genus *Planema* should be given off at or beyond the end of the cell, is in this race as in *itumbana*, variable. Out of 100 bred specimens some have it just before the end of the cell, a large number, at the end, and some beyond.

Here again, this species has not affected other species in its range, with the exception, perhaps, of *Acraea johnstoni* and *Ac. ansorgei*, both of which are themselves distasteful.

THE BIRDS OF KENYA AND UGANDA.

PART V.

by

V. G. L. VAN SOMEREN, M.B.O.U., C.F.A.O.U., ETC.

INTRODUCTION.

The birds dealt with in the following notes belong to the small group of "game birds" known as Sandgrouse. They possess certain characteristics which give them superficial resemblance to Pigeons or Doves, others which suggest a similarity to Plovers and in their feathered legs they resemble the common Grouse. They however form a compact family known as the *Pteroclididae*, represented in Kenya and Uganda by examples of two genera, *Pterocles* and *Eremialector*.

There are certain characteristics which are common to all the species. They are all found in areas which are more or less dry, sandy and stony and where vegetation is sparse or typical of the "bush-veldt." The nesting habits of all are similar, the eggs being laid on the bare ground, usually in a slight depression, and all conform to a general type, being of a curious long oval form or cylindrical, with both ends of similar contour, curiously marbled with superficial and deep markings, and somewhat glossy. The sexes in all species are dissimilar, but all have the front of the legs feathered to the toes. The general type of plumage can be said to be highly cryptic. A marked and peculiar character of these birds is their strict adherence to definite times for drinking; certain species drink only at fixed hours in the morning, others drink only at sunset and dusk. A point relative to this habit has given rise to much controversy: How do the young chicks obtain water seeing that the parents flight such long distances to some favourite watering place? Do the parents carry water in their crops and regurgitate it, or do they carry it in their feathers? Such questions are of exceeding interest yet difficult to answer.

The appended notes are based on our personal experience of the several species found in the territories dealt with, and must not be taken as complete. We would welcome any additional note on habits, etc., and information on the early plumages would be especially useful.

We are especially desirous of obtaining specimens of Sandgrouse for the Museum collection of Game Birds, and sportsmen and others in a position to obtain material are asked to contribute what they can.



Figs. 1 & 2. *Eremialector gutturalis saturator*.
Fig. 3. *Eremialector lichtensteinii hyperythrus*.



Figs. 1 & 2. *Pterocles senegalensis olivascens*.
Figs. 3 & 4. *Eremialector decoratus ellenbecki*.
Fig. 5. *Eremialector decoratus decoratus*.

Photographs of groups in the Nairobi Museum.



Figs. 1 & 2. *Eremialector gutturalis saturator*, male and female.
 Figs. 3 & 4. *Eremialector lichtensteinii hyperythrus*, male and female.
 Figs. 5 & 6. *Eremialector decoratus decoratus*, male and female.



Figs. 1 & 2. *Eremialector quadricinctus lowei*, male and female
 Figs. 3 & 4. *Pterocles senegalensis olivascens*, male and female.
 Fig. 5. Tail of *Pterocles senegalensis olivascens*, male.
 Fig. 6. Tail of *Eremialector q. lowei*, male.

FAMILY PTEROCLIDIDÆ. Sandgrouse.

GENUS **PTEROCLES**, Temm.

Pterocles senegalensis olivascens, Hartert. Masai Pin-tailed Sandgrouse.

Ref. Hartert, Orn. Monatsb. xvii., p. 183, 1909.

Type locality, Simba, Kenya.

Distribution: The plains and scrub country of Teita, Southern Masai and Ukambani, to South of Kenya.

DESCRIPTION: MALE.

Side of head, supercilium and throat ochreous buff, slightly paler on the chin; hind neck and upper breast sandy-ochreous with an olivaceous tinge, shading to rufescent ochreous on the lower breast, this colour merging gradually into the rich chestnut of the belly and flanks. A narrow black band edged with white above separates the upper and lower breast. The centre of the belly is washed with blackish-brown. Crown and mantle ochreous with an olive tinge; lower mantle, inner wing-coverts, and inner secondaries olive-ochreous shading to golden buff at the ends of each feather, most of which are further tipped with chestnut. Rump and upper tail-coverts olive-ochre with a brownish tinge. Tail feathers dark-brown on the inner web, tinged with olive on the outer; all with the exception of the central pair broadly tipped with buff. This buff tip is accentuated by a dark blackish band proximally. Central pair of rectrices abruptly attenuated and extended well beyond the second pair for about an inch and a half; under tail-coverts and feathering on the tarsi sandy buff. Greater and lesser wing-coverts golden-buff, the latter with chestnut tips.

Primaries and primary coverts dark blackish-brown, the six innermost primaries with whitish ends to the inner webs, extending slightly to the outer web. Secondaries blackish-brown, the outer ones with slight white tips, the innermost with broad sandy border on outer web.

Bill. bluish white at tip, darker at base of lower mandible. Eyes brown; bare skin round eye yellowish olive. Feet olive grey.

FEMALE:

Entire head, neck and breast pale sandy-buff, the feathers of the crown, neck and upper breast with dark brown central streaks; the streaked area of the breast separated from the lower uniform buff zone by a row of feathers with brownish bars. Belly, flanks, and thighs brownish-black with narrow cross-bars of rufous-buff. Under tail-coverts and feathering on tarsi pale buff to white.

Mantle, inner coverts, rump and upper tail-coverts rufous sandy-buff with narrow blackish-brown barring. Lesser and secondary coverts sandy-buff with blackish bars and chestnut tips; greater coverts uniform buff. Primaries and primary coverts brownish black, the inner five primaries with white on the tips especially on the inner webs. Secondaries brownish-black, the outer ones with narrow white edges at the tips, the inner ones with brown on the edge of the outer webs. Rectrices blackish-brown with rufous-buff barring and buff tips. The outline of the tail is an abrupt wedge, tapering towards the central pair which extend beyond the rest.

Colour of eyes, feet, and soft parts as in the male.

JUVENILE:

The first feathered plumage is unknown to me, but that of a young male in second feather is very like the adult female, having much the same general appearance but differs in being more rufescent on the mantle, more barred on the breast, and a lighter brown on the belly.

HABITS:

The Masai Pin-tailed Sandgrouse is found in the dry, stony country of the Massai and Wakamba, where the thorn bush is sparse and low. Like the majority of this group, they are mostly in evidence when coming to or at water, for their morning drink. At a favourite watering place they may be encountered in hundreds, but at other times when dispersed in the surrounding country, one may see a small flock of half a dozen birds or perhaps a single pair. Their colour harmonises so well with the general aspect of the ground that it is very difficult to "spot" a sitting bird unless it moves.

I have encountered a sitting bird on more than one occasion, yet, though within a yard or so have not detected it until it started to leave its nest. If the eggs are fresh the parent leaves long before one is near the spot, but if on the point of hatching she sits close.

Two to three eggs form the clutch; they are wonderfully coloured, the ground colour varying from pale ochreous to cream or greyish with streaks or blotches of bluish-grey and mauve underlying the surface and varying shades of brown and olive-tawny spots, blotches and streaks on the surface. In shape they are a long oval and measure 36.5 to 37 x 25 mm. We have records of nests found in the months of June, July, and December.

As a sporting bird the "Pin-tail" offers good shooting, as they are very fast on the wing, but to a good shot they are not difficult, as the flight is direct.

From personal observation it would appear that this species is resident in its distribution throughout the year.

Pterocles senegalensis somalicus, Hartert. Somali Pin-tailed Sandgrouse.

Ref. Hartert, Nov. Zool. vii., p. 28, 1900.

Type locality, Milmil, Somaliland.

DISTRIBUTION :

The northern portion of Jubaland, and the thorn-bush country north of Mt. Kenia, westward to Baringo and Lake Rudolf, and Turkhana.

DESCRIPTION :

Male and female. Very like the preceding race but paler throughout. In the male the head, neck, and upper mantle are much brighter isabelline golden, without the olive tinge; the coverts are all much more broadly tipped with golden buff.

HABITS :

As with the preceding race. Typical examples of the Somali race are found in the northern districts of Jubaland and towards the southern Abyssinian border, but when we come to the North Kenia birds and those inhabiting the Turkwell and Turkhana areas we find a certain number tend to be intermediate in colouration, and approaching the form *olivascens*; there is no sharply defined boundary between the two forms.

GENUS **EREMIALECTOR**, Sel.

Eremialector decoratus decoratus, Cab. Southern Bridled Sandgrouse.

Ref. Cabanis, J.F.O., 1868, p. 143.

Type locality, Lake Jipe, Tita.

Distribution: In the drier parts of Kenia, Serengetti, Yatta, and Massai district and south of Mt. Kenia.

DESCRIPTION. MALE ADULT :

Forehead, except for extreme base, lores and centre of the throat, black, outlined with white; the white extending back over the supercilium and bordered below with black. Base of mandible and chin, white. Side of head, neck and ear-coverts, sandy buff, the latter streaked with blackish. Upper breast sandy-buff washed with olive: lower breast white, separated from the upper by a narrow black line. Abdomen and flanks dark blackish-brown, most of the feathers with narrow white tips. Crown and hind-neck sandy-buff streaked with blackish; mantle, rump and upper tail-coverts buff, barred with black; wing-coverts buff with widely spaced irregular broken black bars. Primaries blackish brown, darker on the inner ones; outermost feather with buff or white outer web; five inner ones with white

margined tips. Secondaries blackish-brown with white margins at end; inner ones with rufescent edges and vermiculations on the outer webs. Rectrices buff with whitish ends and irregular black bars; central pair vermiculated with blackish. Under tail-coverts whitish to buff with angular black bars. Feathers of thighs and tarsi whitish. Bill ochre yellow, paler on mandible. Cere yellowish. Feet greenish-yellow.

FEMALE:

Throat, side of head and supercilium sandy-buff, slightly spotted at the gape and streaked on the ear-coverts with blackish. Lower neck, upper half of breast and hind-neck sandy buff with blackish bars. In some specimens the black marks on the mid upper breast are rather circular, enclosing a somewhat cordate area of the ground colour. Rest of the plumage of the underside as in the male, with the white on the abdomen more pronounced. Mantle and scapulars and lesser coverts, rich sandy-buff with wavy irregular black submarginal lines following the general contour of the feathers, internal to which are irregular wavy cross bars. Rest of the upperside as in the male but ground colour rather darker, and black markings wider and more pronounced. Bill horn-brown, paler on the lower mandible; cere greenish yellow; feet yellowish olive.

JUVENILE:

The young in first feather are sandy buff below, each feather with an angular subterminal black bar; the belly brownish with buffy tips to each feather. The upper surface is rusty brown heavily barred with black. The wing feathers are variegated chestnut and black. This plumage rapidly gives place to the intermediate one which resembles somewhat that of an adult female, but is altogether brighter and more reddish. The feathers of the crown, hind-neck, and the whole of the upper surface including the wing-coverts are reddish chestnut with pale buff tips and blackish centres; those of the mantle and wings have in addition, two or more wavy black cross bars.

The scapulars and secondaries have buff tips and margins to the outer webs while each black bar is outlined proximally with bright chestnut. The ends of the primaries are chestnut with pale tips and blackish vermiculations. Both male and female, at this stage have sandy-buff breasts tinged with rusty brown towards the tips, each feather with an angular bar. The lower breast is a dirty buffy white; the abdomen is brownish with wide white tips to the feathers.

The young bird moults directly from this plumage into that of the adult male or female; the change being a gradual one.

HABITS:

The Bridled Sandgrouse is undoubtedly the commonest species in Kenya and is more often "put up" during a day's shooting in

scrub country than any other. They are found throughout practically the whole of the thorn bush country from the Kilimanjaro border to north Ukambani, frequenting the open patches of stony ground. Sometimes one comes upon them in quite thick bush where their special food plant happens to be growing. In the ordinary way one flushes them in pairs or possibly in small parties of six or so; it is only when they have congregated at some favourite drinking place that one sees them in numbers, varying from a dozen to sometimes a couple of hundred.

These birds are very conservative and fastidious about their drinking places; the same bunch will visit one particular spot daily until the water is dried up, or one drifts at a river where the water is shallow and easily accessible. They seem to prefer a spot where the ground is clear of bush and the slope to the water is gradual. They certainly prefer clear to muddy water.

These birds have two call notes, one uttered when suddenly flushed while feeding, consisting of a sharp repeated "chuck," the other a high whistling call consisting of three syllables, the first two drawn-out, the last short and abrupt.

The nesting season is rather irregular. Jackson found the birds breeding on the Usuri Plains in June and July, Praed found nests in August on the Serengeti, while my records are Tsavo in October and April on the Loita and Taveta.

Practically no attempt is made at constructing a nest, the two or three eggs which form the normal clutch being laid in a mere depression in the earth; little or no material being added as a lining. The eggs are somewhat glossy, and long oval in shape. The ground colour is "putty-coloured" or buff with mauve markings below the surface and liver or red-brown spots and marbling on the surface.

The food consists of bulbous roots, grass seeds and small leguminous seeds, as well as insects. I have occasionally put these birds up from amongst a small patch of ripening m'wele, but they do not usually frequent cultivations.

Eremialector decoratus ellenbecki, Erl. Northern Bridled Sandgrouse.

Ref. Erlanger, J.f.o., 1905, p. 92.

Type locality, Sidimun, South Somaliland.

Distribution: Jubaland and the districts north of the Northern Guasso Nyiro.

DESCRIPTION. ADULTS:

Very similar to *decoratus decoratus* but paler throughout. The difference between this and the southern race is more marked in the

females than the males. The black areas of the feathers are more restricted, while the marginal borders are wider and paler buff; the intervening areas are however more rusty brown.

HABITS:

Similar to the preceding race.

Taken as a whole, the Bridled Sandgrouse can be said to be an inhabitant of the bush veldt rather than the open plain. They are quite sporting little birds and offer good shooting either when walked up in the bush or when fighting to water.

Eremialector gutturalis saturator, Hartert. Eastern Yellow-throated Sandgrouse.

Ref. Hartert, Nov. Zool. vii., p. 29, 1900.

Type locality, Simba, Ukambani.

Distribution: In suitable localities throughout the drier parts of Kenya.

DESCRIPTION. MALE ADULT:

Forehead and crown dull olive shading to golden-olive on the back of the neck; a buff line outlined in black stretches from the base of the bill, above the nostrils to a point above the posterior angle of the eye. Below this line is a black streak which extends from the gape to the anterior angle of the eye. The chin, throat, cheeks, and ear-coverts are buff shaded with yellow. The distal and lower edge of this throat patch is set off by a broad purply black band; chest and breast grey, shaded with golden-olive at the neck band, and with olive-brown distally, the whole shading in gradually into the dark chestnut of the lower breast and abdomen; under tail-coverts and thighs chestnut with black bars. Tarsi rusty brown. Mantle back and upper tail-coverts olive-grey shaded with brownish; scapulars dark ashy-grey shaded at ends with olive-brown; wing coverts grey at the base, broadly tipped with bright rusty brown to light chestnut. Lesser coverts greyish-olive shaded distally with rusty-brown. Primaries and outer secondaries black with very narrow pale margin at ends. Inner secondaries with greyish olive shading on outer webs, tinged with brownish. Rectrices black, with rusty-brown tips and olive shading on outer webs; the three outermost with dentate marks of rusty-brown; central pair olive-greyish.

FEMALE. ADULT:

Chin throat and ear-coverts sandy buff; supercilium of the same colour, separated from the buff of the side of the head by a black line which extends from the nostrils to the anterior angle of the eye. A small blackish spot just above the eye. Crown nape and the rest of the upperside yellowish buff, each feather with a blackish centre,

slightly expanded at the end; the longer feathers with one or more blackish bars. Upper chest similar to the mantle, but black marks finer; breast, abdomen and flanks rusty buff with blackish barring. Under tail-coverts dull chestnut. Primaries as in the male. Eyes brown; feet pale grey; bill slatey-grey.

JUVENILE:

The chick in down is unknown to me.

HABITS:

The Yellow-throated Sandgrouse is the largest species found in Kenya and Uganda and although widely spread is not very common.

As with other species, their numbers can best be gauged when flocking at a watering place; some observers have stated that the birds come to water in hundreds, but personal observation over a number of years leads me to believe that they seldom reach even a hundred birds. At a certain watering place on the Athi Plains, the Yellow-throat is to be seen fighting in, in batches of a dozen to forty birds at a time. The flight is swift and strong, and after circling the water once or twice at a considerable height, they swoop down to within a few yards of the spot and run to the water's edge. Very little time is spent in actually drinking, and as soon as one batch of birds is finished another appears, their advent heralded by the rather harsh "gruck-glock" of the males. The flocks do not appear to keep together after leaving the water; they break up into small bunches and disperse in various directions to their feeding grounds.

These birds come to water between 8 and 10 a.m. During feeding time they frequent waste stony ground where the scrub is stunted and grass is short. They feed largely on grass seeds, small bulbs and seeds of a leguminous plant; they also take insects.

It is not unusual to put these birds up in bunches of four to six or in pairs during the breeding season, but they do not fly far and can usually be walked up once or twice before going off any distance, for they do not run once they have pitched; they much prefer to squat, and allow one to come quite close before taking wing. They are very partial to ground which is burnt off, especially so when the young grass is beginning to sprout. The breeding season is comparatively short, and extends over August and September; though a few birds also breed in January. Practically no attempt is made at constructing a nest, the eggs being laid in a shallow depression in the earth, which is sometimes lined with bits of grass and small pebbles. Two to three eggs form the full clutch; they are pale sandy buff or olive buff, with spots and streaks of red-brown, and mauve blotches underlying the surface. The size is very constant, the average egg measuring 44 x 34 mm.

It is very essential that this species of Sandgrouse should be protected during the breeding season, especially so as one of its favourite nesting grounds is within easy reach of Nairobi; the activities of the so-called sportsman who does not care two raps whether the birds he shoots are nesting or not should be stopped now, before the birds are driven to seek fresh breeding grounds!

Eremialector lichtensteinii hyperythrus, Erl. Somali Barred Sandgrouse.

Ref. Erlanger, J.f.O., 1905, p. 94.

Type locality: Daua River, S. Somaliland.

Distribution: The northern half of the Juba River district and the Northern Frontier area bordering on Southern Abyssinia.

DESCRIPTION. MALE:

A triangular area at the base of the bill, white, surmounted by a broad black band which stretches across the forehead from lore to lore; this in turn followed by a narrow white band in line with the anterior angle of the eyes. Supercilium white, with a patch of black feathers directly above the eye. Rest of crown, nape and cheeks pale buff streaked and spotted with black. Throat uniform sandy buff. Upper breast, mantle back, rump and upper tail-coverts sandy buff with distinct black barring; rest of breast golden ochreous buff with, in the mid line, crossing from side to side, a narrow black or chestnut black band; the lower edge of the buff breast band is bordered by a black band which separates it from the abdomen, which is white or pale buff narrowly barred with crescentic black lines; thighs and under tail-coverts similarly coloured. Wing coverts pale buff with ends of sandy buff, each feather strongly barred with two or more black bars; scapulas and innermost secondaries rich sandy to rufescent buff with wavy black barring. Primaries brownish black with narrow pale margins to tips; two outermost primaries with pale outer webs. Secondaries brownish-black, the inner ones with large pale buff patches on the outer webs which are obliquely lined with black. Rectrices rich ochreous buff with marked black bars which stop half an inch before the ends, so that the tail feathers are widely buff tipped. Feathers on tarsi white. Feet yellow; bill yellow, darker at tip of upper mandible. Cere round eye, yellow with slight greenish tinge on upper eyelid. Eyes brown. Average length of wings 184 mm.

FEMALE. ADULT:

Crown sandy buff streaked with blackish; rest of head including the throat sandy buff spotted with black. Upper breast, mantle,

scapulars, lesser coverts, and innermost secondaries rufescent-buff narrowly barred with fine wavy black lines; marginal coverts almost uniform sandy-buff; rest of wing-coverts pale buff, richer terminally, all narrowly barred with wavy black lines. Primaries and secondaries as in the male. Belly pale buff with black barring; flanks greyish with angular black bars. Soft parts as in the male, but bill more horn yellow.

JUVENILE:

Unknown to me.

HABITS:

The Somali barred Sandgrouse does not differ in habits from the other race inhabiting Kenya. It comes to water in the evening with the regularity of clockwork. We have no record that these birds partake of a morning drink; in fact the one at evening seems to suffice for the entire 24 hours. They were particularly numerous at a drinking pool on the Upper Juba River at Lollesheid and again at Dolo, but during the day very few birds were put up in the surrounding country; they appeared to forage at a great distance from water. I am indebted to my friend Dr. Bevan for obtaining the specimens on which these notes are made.

Eremialector lichtensteinii sukensis, Temm. Suk Barred Sandgrouse.

Ref. Neumann, Orn. Monatsb., 1909, p. 153.

Type locality, Turkwell River, Suk.

Distribution: The low-lying desert country stretching between Lake Rudolf and north of Elgon and Mt. Kenia, including eastern Turkhana. Turkwell, Suk and the Northern Guasso Nyiro to Marsabit and Karoli.

DESCRIPTION. MALE AND FEMALE:

Very like the South Somali race but generally darker above, due to the black barring being wider and the light areas of the wing coverts being less pale. The abdomen is considerably darker. Bare skin round the eye, yellow; feet rich yellow; bill yellowish-horn, darker at tip; eyes brown.

JUVENILE:

The chick in down is unknown. The young in first feather is as follows: Head, neck, breast and mantle greyish buff with fine blackish barring less pronounced on the throat; a slight indication of a chest

band, due to the feathers being less barred; scapulars sandy-buff with black barring; wing coverts and inner secondaries greyish with fine black vermiculations; primaries brownish-black with pale ends finely vermiculated; abdomen greyish with rather ill-defined blackish barring. Feet olive yellow; bill blackish above brownish below.

HABITS:

The Suk barred Sandgrouse inhabits the dry sandy bush country south of Lake Rudolf and although only met with in pairs or small coveys of six or so during the day, yet when they flock, just before, and at dusk for their evening drink at some favoured water hole or pool in an almost dried up watercourse, they may be seen in large flights. They come to the watering spot at the same time each evening and although a couple of dozen birds may arrive together their approach is swift and noiseless. The time spent in actually drinking cannot be more than a few minutes judging by the numbers which come to and leave a small pool in the space of quarter of an hour. At one particular water hole where I observed these birds there was a continuous stream coming to and going from the spot for well over an hour. These birds are unusually silent so much so that their arrival and departure would not attract attention if one were not actually observing the vicinity of the drinking place.

I have not found the eggs of this species, but Jackson states that they were breeding in the Baringo district in May, while my young birds in first feather were probably hatched in April in the Isiolo district.

Eremialector quadricinctus lowei, C. Grant. Eastern Barred-wing Sandgrouse.

Ref. C. Grant, Bull, B.O.C. Cl. xxxv., p. 19, 1914.

Type locality: Renk, White Nile.

Distribution: The northern districts of Uganda east to the Turkwell River.

DESCRIPTION. MALE:

Forehead broadly black, with a small patch of white at base of bill, and bordered above by an incomplete white band; supercilium white with a black spot above the eye; centre of crown rufescent buff, each feather with a black shaft steak; side of head, ear-coverts and throat golden-buff, slightly paler on the last; nape, hind-neck and upper breast rich sandy ochreous, the first two areas washed with alive; lower breast banded with chestnut, followed by a broader white band edged distally with black. Abdomen, flanks, thighs, and tarsi, banded black and white. Rump, upper tail-coverts rectrices and

under tail-coverts rich ochreous golden barred with black. Lesser coverts at bend of wing uniform golden-buff with a broad glossy blue-black sub-terminal bar outlined with white; these bars arranged in such a way as to form a series of oblique parallel lines across the wing. Primaries and outer secondaries brown-black; inner secondaries brown-black on the inner webs and sandy-buff on the outer, with an oblique black bar outlined with white.

Mantle and scapulars rich ochreous buff shaded with chestnut towards the ends, the feathers of the former with transverse black bars, the latter with angular blue-black bars, slightly confluent.

Feet chrome yellow; bill yellow at base, horn-brown at tip; eyes brown; bare skin round eye, dark yellow.

FEMALE:

Crown and nape rich rufescent buff, each feather with black shaft streak or terminal black spot; supercilium and cheek, throat and breast sandy buff, richer on the last area; lower breast buff with black barring; back of neck rufescent buff with black bars; mantle and scapulars rich rufescent-brown, with heavy angular black bars and pale golden-buff margins. Wing coverts golden-buff with one or more narrow black bars. Rump similar to the mantle; upper tail-coverts, rectrices and under tail-coverts rich sandy buff with transverse black barring. Abdomen, thighs and tarsi barred black and white. Soft parts as in the male, except that the bill is horn-brown.

JUVENILE:

We have no young birds, neither does there appear to be any published description.

HABITS:

This species inhabits the dry stony bush-veldt or northern Uganda and the South Rudolf district, thus overlapping somewhat the distribution of *E. l. sukensis*; indeed in its south-east area it actually associates with that species when flocking at some favoured watering place.

It is an unusually silent bird and utters no note even when flushed from its feeding ground. The time of flight to the watering place is later than any other species I know, the majority seek water long after sundown, when it is impossible to see clearly, far less make observations on behaviour.

My friend, Capt. Stoneham, writing in the Ibis on his experiences with this bird in Uganda, states: "This Sandgrouse is common. By locating the drinking places . . . many could be shot nightly as they flighted to drink, but it was difficult shooting, as they rarely

flighted till well after sundown, when it was so dark that they were difficult to see. They were silent birds; never once did I hear one utter a sound when in flight. Their flight too is noiseless, unless alarmed. Whilst waiting for birds at dusk they frequently arrived and alighted quite close to me without a sound. After arriving at the river they would remain for some time if undisturbed, well into the night, 'bathing' in the dry sand of the river-bed. By day they were sometimes flushed from short grass or mtama and simsim fields. . . . Large flocks were never seen, the maximum of birds observed fighting together being less than a dozen."

There are no published records of the nesting time of this species.

The Journal

OF THE

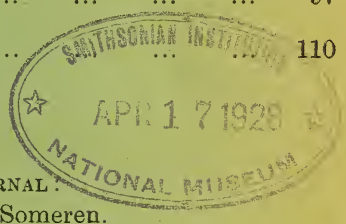
EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

July, 1927.

No. 30.

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EDITOR OF JOURNAL:
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Additional copies to members, Shs. 5/-; to non-members, Shs. 10/-.

(Date of publication, February, 1928.)

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(Date of publication, February, 1928.)



A

B



C



D

PLATE XLI.

A. *Euxanthe e. ansellica* var. *radiata*.

B. and C. Dorsal and lateral view of *Euxanthe* pupa.

D. Larval heads of

Fig. 1. *Euxanthe e. ansellica*. Fig. 4. *Euxanthe wakefieldi*.

Fig. 3. *Euxanthe wakefieldi* (3rd instar).

Fig. 2. *Euxanthe c. ansorgei*. Fig. 5. *Euxanthe tiberius*.

THE BUTTERFLIES OF KENYA AND UGANDA.

PART VI.

By

V. G. L. VAN SOMEREN, F.E.S., F.L.S., etc.,

and

REV. K. ST. A. ROGERS, M.A., F.E.S.

FAMILY NYMPHALIDÆ.

SUB-FAMILY NYMPHALINÆ.

INTRODUCTION:

The *Nymphalinx* form one of the largest subfamilies of butterflies, and are usually regarded as representing the highest development of the order *Lepidoptera*.

Although they include some small species, they are for the most part medium or large butterflies. They are active insects and some species are remarkable for their powerful flight. A large proportion are of brilliant colouring and some are amongst the most beautiful of all known butterflies.

The larger number of the species haunt woodlands or forest country and comparatively few are found in the open. West Africa is much richer in number of species and individuals than East Africa.

The perfect insect is characterised by the fore-legs in both sexes being imperfectly developed, but there is a good deal of diversity both in appearance and habits. The larvæ are generally armed with branched spikes and the pupæ are angulated, but *Charaxes* and its allies have smooth larvæ and pupæ, except that the head of the larvæ has conspicuous horns.

Some of the species are well known for their migratory habits, e.g., *Atella phalantha*, *Pyrameis cardui*, *Hypolimnas misippus*, and *Crenis natalensis*. *H. misippus* has been observed in considerable numbers far out in the Atlantic and has established itself in South America during the last century.

Some genera, e.g., *Hypolimnas* and *Pseudacraea*, include some of the most remarkable known examples of Mimicry, and others such as *Precis*, the best known examples of diverse seasonal forms.

The butterflies of many genera are in the habit of basking with out-spread wings in the full sunlight and the males of many species are attracted by strong-smelling substances such as the excreta of carnivora and also by the fermenting exudations found on certain trees and to damp spots near streams.

The numerous species have conveniently been divided into tribes as follows:—

Argynnidi.—These include *Lachnoptera*, as endemic genus; *Atella*, common to the Oriental region; and *Argynnis*, characteristic of the Holarctic region of which a few species occur at high elevations.

Vanessidi.—Include the cosmopolitan *Pyrameis cardui*, *Antanartia*, with its nearest allies in South America; *Precis*, found throughout the tropics, including the wonderful examples of seasonal variation notably *P. sesamus* and *P. antilope*; *Salamis*, an endemic genus of great beauty; and *Hypolimnias* or *Euralia*.

Eurytelidi.—Also found in the Oriental Region though there is one endemic genus, *Neptidopsis*. This genus may be recognised by the swollen sub-costal nervure, a character unique amongst the *Nymphalinxæ*.

Eunicidi.—With a single endemic genus *Crenis*, all the other members of the tribe being South American.

Neptididi.—With many species which are very difficult to differentiate. This genus has two or three European species but is most developed in the Oriental region.

Nymphalidi.—With several endemic genera and many species chiefly West Africa. The great majority of the species of this tribe inhabit dense forest and fly rapidly close to the ground. The larvæ have long branched and feathered spines on the sides of the body so that they are difficult to see on the food plant, and it is only of recent years that they have become known. One abundant species, *Hamanumida dædalus*, haunts sunny paths in open places, but it still preserves the habit of flying rapidly just above the ground and frequently settling with out-spread wings. The genus *Pseudacraea* has generally been included in this tribe but its habits are quite different as it has a floating flight like a *Neptis* and now that its larvæ are known, they also differ markedly from others of the tribe.

Marpesidi.—Including the single genus *Cyrestis*, common to the Oriental region though most of the tribe are South American.

Charaxidi.—These include two endemic genera, but the bulk form the genus *Charaxes*, common to the Oriental region. Many of the species are large insects of very powerful flight, much addicted to settling on the branches of trees, though they often bask. They include some of the most beautiful butterflies in the country and one section of the genus has butterflies with highly ornamented undersides, the varied colours of which are most harmoniously blended, reminding one of a Persian carpet. The species of the endemic genus *Charaxes* also settle on the branches or trunks of trees generally head downwards.



A.

PLATE XLII.

B.

Under and Upper surfaces of ♂ and ♀ *Euxanthe trajanus* Sb. sp. Nov.

CHARAXIDI.

GENUS *EUXANTHE*.

The members of this genus are characterised by their large size, very rounded wings, especially in the males, their brilliant colouration, and characteristic larvæ and pupæ.

They are divided into two groups:

- A. Base of the fore-wing above with a large triangular red-brown area; cell of hind-wing closed; F.-w cell almost triangular, its posterior angle not or but little more produced than the anterior.
- B. Base of fore-wing above without red area. Cell of h.-w. open; cell of f.-w. obtusely rounded at anterior end and long produced at the hinder angle so that it is semi-circular in shape (Seitz).

A. *EUXANTHE TRAJANUS*. Sub.-sp. Nov. Pl. XLII., fig. a & b.

Expanse: Male 90-98 mm. General colour black with white and cream spots.

F.-w.: Basal $\frac{3}{4}$ of cell and basal angle of 2, red-brown; distal $\frac{1}{4}$ of cell, pale creamy yellow proximally shaded with black; rest of wing black, carrying white and creamy-yellow spots as follows: three, sometimes four, submarginal at the apex in 5, 6 and 7; a series of four large oval white spots in 4, 5, 6, 7, forming a broken sub-apical bar, followed by three smaller submarginal white spots in 1b, 2 and 3; a yellow-shaded white bar continuous with the light spot at the apex of the cell, crosses the wing towards the hind angle, is made up by a series of spots, one each at the bases of 3 and 4, a large rectangular mark towards the base of 2, two spots in 1b, the upper large and situated about mid-point of upper edge, the other much smaller situated below and distal to the one above. Area 1a has a linear mark of blue-grey scales increasing in width from the base to just beyond mid point.

H.-w. black, with a submarginal row of double white spots from 1c to 7, with an occasional extra spot inset in 7, the central area of the wing with a triangular greyish-white patch shaded yellow in the middle, bounded below by the lower edge of 1c and above by the upper margin of 5.

Underside: F.-w ground leaden-brownish-black; markings as above with the sub-apical dots omitted, but an additional minute white dot at base of costa. H.-w blackish-brown with a suffusion of red-brown scaling especially towards the base of the wing and costa; pronounced black internervular and nervular rays; with a varying number of very small white dots usually in 1c to 3.

FEMALE:

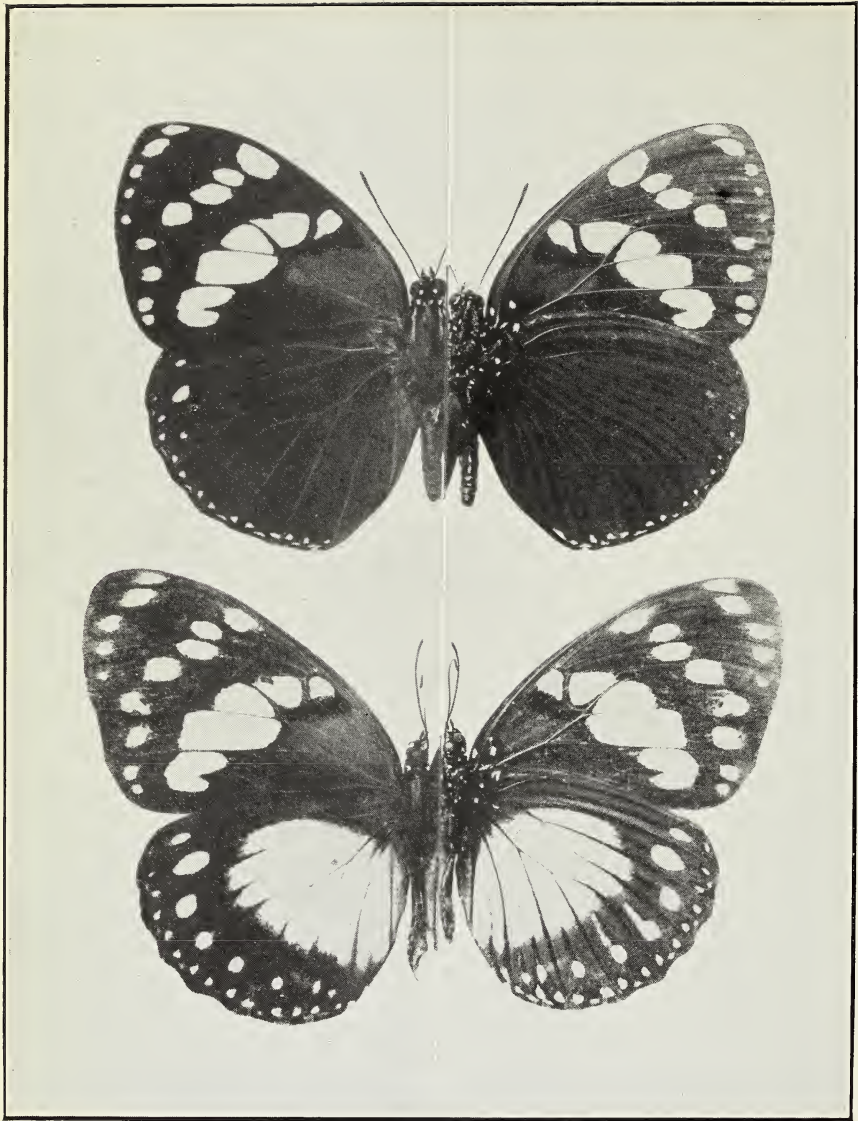
Expanse 116 mm. Upperside: F.-w. somewhat similar to the male, but ground colour less black, while the light area at the apex of the cell represented by a few white scales. H.-w. Markings as in the male but the central patch creamy-yellow shaded at the anal angle with rufescent scales; submarginal row of double spots larger, and internal to these, a second row of single larger spots on the inter-nervular rays.

Underside: F.-w a dull replica of above, but with only one sub-apical white spot; a marked white line at the apex of the cell and a black area at the base carrying a white dot.

H.-w.: Ground colour leaden-blackish-brown, with black nervures and inter-nervular rays; pale patch of above represented as a white area distally bordered with rusty scaling; base of wing rufescent, carrying two white spots in 9 and 8. The white spots of above are represented, but of reduced size, while in addition there are small white dots almost on the margin, internervularly.

EARLY STAGES:

The eggs of this species resemble to a marked degree those of the genus *Charaxes*, and in this as also in the form of the larva and pupa we have evidence of the relationship of the two genera. The egg is of the large spherical type, slightly flattened above and strongly fluted with a slight depression at the mid point. When newly deposited it is yellow, but within forty-eight hours it becomes slightly brownish above, turning a reddish brown a few days before hatching and then quite black just before the larva emerges. They are laid on the leaves of saplings of *N'koba*, a timber tree of considerable value in Uganda. The egg stage lasts eight to ten days. The newly-emerged larva is brownish-olive, with a black head, the whole surface finely papillated. This colour is retained until the second moult when it changes to a dull olive; the head at this stage takes on the characteristic shape peculiar of the *Euxanthe* group (v.p.) In the final stage the larva is a bluish-olive green above, laterally bordered with a whitish-yellow wavy spiracular line, the third to ninth segments strongly keeled so as to form a frill along the side of the body. The dorsum of the sixth segment carries a raised ovoid yellow spot while the eighth has a small round one. The anal segment has a markedly bifid tail. The head is almost circular in outline carrying along the upper arc eight spines or horns, in pairs; the outermost pair arise just before the junction of the lateral quadrants with the upper, they are long and gradually taper to a point, yellow at the base and black tipped, are directed outwards and slightly upwards for about two-thirds of their length then turn up abruptly and at the tips are inclined backwards; the next longest



A.

PLATE XLIII.

B.

Upper and Under surfaces of ♂ and ♀ *Euxanthe tiberius*.

pair arise at the midpoint in the halves of the upper quadrant, they are uniformly black, slender, straight, and sharply pointed; between these two are two short black spines and between them and the lateral curved horns, are two short yellow spines. All carry sharp lateral spikes, those of the lateral horns are mostly on the upper and posterior sides. Below the outermost horns and slightly posterior to the facial disc are two spines and a series of tubercles. The actual mouth-parts are black. The ground colour of the disc is olive-yellow with olive-green lines radiating from the centre towards the bases of the two long pairs of horns, and on either side of the mouth.

The larval stage lasts 20 to 30 days (captive specimens). The pupa is olive green, strongly ventricose and suspended from a stalk-like cremaster. The head case is bluntly bifid; the dorsum of the thorax keeled slightly, while the second and third abdominal segments are dorsally produced into two pronounced protruberances; each segment except the first bears a reddish spiracular spot; the lateral angles of the wing scutæ are well developed. The cases themselves are decorated with white enamel-like wavy markings especially at the bases of the wings. There are two transverse white lines on the dorsum of the thorax, while a white dot ornaments each lateral angle of the wings.

DISTRIBUTION:

The Uganda form of *Euxanthe trajanus* appears to be a rare insect and has only been taken by us in two localities in Uganda. Not more than a dozen specimens are known. It differs from the typical West African form.

EUXANTHE TIBERIUS, Smith. Pl. XLIII., figs. a & b.

Expanse: Male, 92-100 mm. General colour brown-black with light markings in forewing. Sexes unlike.

F.-w.: Ground colour black; upper half of base of wing red-brown, thus almost filling the whole of the cell; distal end of cell, black with a lemon yellow spot in upper corner.

A sub-apical row of white spots continued sub-marginally extends from 8 to 1b, that in 1b is doubled and those in 2 and 3 are set slightly internal to the line of the remainder. A sub-apical bar of four pale lemon-yellow spots crosses the wing at mid point of 7 and 4. This is followed by a slightly curved mid-alar bar composed of interrupted spots, pale lemon-yellow in colour extending from beyond the apex of the cell towards the hind angle, occupying the base of 4, 3, sub-basal in 2, and the proximal end of the distal third of 1b.

H.-w. uniformly brownish black with a violet bloom, with a sub-marginal row of small double spots from 2 to 7, areas 5 and 6 with an extra, larger inter-nervular spot set internal to the sub-marginal ones.

Underside: Ground colour blackish scaled with rusty-brown distally, pattern as above, with an additional white spot at the base of the cell which area is blackish. H.-w. uniform deep rusty-brown with black scaling along the veins and internervular rays; sub-marginal spots as above with transverse white internervular marginal streaks.

FEMALE:

Expanse: 110 mm. F.-w.: Pattern of the fore-wing as in the male, but the spots are white and larger. H.-w. black with a large white discal area which reaches the inner margin; the black border contains two rows of white spots, the inner ones larger and placed internervularly the outer sub-marginal and small, two to each cellule. The margin itself carries white internervular streaks.

Underside: F.-w. as above but ground colour rusty especially towards the apex; the extreme base of the cell is black and carries a white spot; the base of the costa is black with a white spot. H.-w.: Markings as above, but the ground colour is red-brown intersected with black veins and internervular rays to the margin of the white patch.

EARLY STAGES:

The eggs of *E. tiberius* are laid singly on the leaves of a forest tree not yet identified, but known to the Baganda as "Muziru." When first deposited they are creamy, but develop a brownish ring within 48 hours and as development proceeds the brown colour extends to the entire base, subsequently becoming black just before the larva emerges. The egg is a slightly depressed sphere with a central depression from which fluted rays extend outward to form a star. The young larva up to the first moult is olive brown turning more greenish at the next instar, at which time the head, which was originally black, becomes olive and surmounted with short spines. At the third and fourth instar, the ground colour is olive-brown with olive-green patches on the dorsum of the third to ninth segments; the lateral aspect of these segments are expanded in the form of a frill which is pinkish or red in colour. Below this wavy line the body is ochreous pink; the forelegs brown, and the suctorial ones ochreous. The 6th and 8th segments are dorsally ornamented with raised crescentic white patches. The anal segment carries a flattened bifid tail. The head piece is characteristic, very like that of *E. trajanus* but the long lateral horns taper more abruptly and are not inclined backwards at the tips. The posterior aspect is black; the anterior is yellow at the base shading to orange up to the bend, while the tip is jet black. The central long pair of horns are slender, finely pointed and black anteriorly, green at the back. The short spines of the interspaces are orange. The facial disc is ochreous-orange with olive-green markings arranged as follows: Four lines arise from the



A.

PLATE XLIV.

B.

Under and Upper surfaces of ♂ and ♀ *Euxanthe crossleyi ansorgei*.

centre of the disc and pass upwards, one to each of the four uppermost horns, two short lines are directed towards the long lateral horns but do not reach their bases; a green spot is however present at the base of these horns. A green transverse line is present above the black mouth parts surmounted by a brown dot at the extremities. The spines on the posterior surface of the margin of the facial disc are orange at the bases and black tipped; the longest of these is branched.

DISTRIBUTION:

This species is found in the forested areas of the Coastal belt, and has recently been taken by us in the Meru forest near Kenia. This distribution is peculiar and it would be of great interest to know whether the species occurs in the forests along the Tana River. Rogers has taken *E. tiberius* in some numbers at Rabai, but it cannot be called common. It is entirely a forest species keeping to the dense areas where it is difficult to detect unless in flight. It usually settles on some sapling under the shade of large trees. Its flight is rather slow and not of long duration. Females are much rarer than males, and even more sluggish in their movements.

EUXANTHE CROSSLEYI ANSORGEI, Rothsch. Pl. XLIV., figs. a & b.

Expanse: Male, 90-95 mm. General colour black with yellow-green markings.

F.-w.: Ground colour black slightly rufescent at the base of the costa. Markings as follows: A series of five small sub-apical white dots extending from 8 to 4 followed by two irregular spots set more internal in 2 and 3; a double sub-marginal spot in 1b. A series of four somewhat linear marks, yellowish-green in colour cross the apex of the wing from 8 to 4; internal to these are four larger linear yellowish-green marks distal to the apex of the cell; a further four large linear or irregular shaped marks cross the wing from the distal half of the cell to the posterior angle; a long linear mark of the same colour fills the mid-third of 1a.

H.-w.: Discal area yellow with a greenish tinge, this invaded by the black of the border extending up along the veins; the black border ornamented with three rows of spots as follows: a sub-marginal series consisting of somewhat triangular white marks, duplicated in 1c, at mid-point between the veins; a second row of twin spots in each internervular space follows the contour of the wing; this in turn is followed by a third row of large ovoid lemon-yellow spots, double in 1c, placed parallel to the second row and at mid-point in each internervular space from 1c to 7. The abdomen is tawny-orange in colour.

Underside: F.-w.: Distribution of spots as above; distal half of wing ochreous-brown, proximal, black.

H.-w.: Light marks as above; veins black-scaled and prominent; base of wing tawny; border of wing ochreous-brown.

FEMALE:

Expanse 108-110 mm. Somewhat like the male, but black ground less intense; light markings similar in distribution but larger and pale yellowish-white.

EARLY STAGES:

The eggs of *E.c. ansorgei* are almost spherical with a slightly flattened area on top, faintly fluted. The surface is semi-matt and creamy in colour. As development proceeds the egg turns brown, first at the rim and then throughout the entire surface. The eggs are laid on the mature leaves of a forest tree—known to the Baganda as N'kuzanyana. The larva is at first olive-brown with a black head. It becomes olive-green at the first moult with a strongly bifid tail, while the head is ornamented with short spines arranged as in the mature insect (q.v.) In the final stage the larva is sage green with two raised yellow oval marks on the sixth and eighth segments; the spiracular line is prominent and pinkish-yellow in colour, undulating and forming a frill along the side of the body. The underside of the body is greyish-brown. The head-piece consists of a disc surmounted by four pairs of horns; the lateral pair, 10 mm. long, arising from the upper end of the lateral quadrants are long and cylindrical with a slight bulbous end, finely papillated all over and spined on the posterior surface. They are brown in colour and are directed outward and upward for two-thirds their length, then curve inwards. The next and central pair are short, laterally spined and yellowish in colour.

The intervening pair are 5 mm. long, straight, and taper abruptly to a point, heavily spined basally and reddish brown in colour. The ground colour of the disc is dull green, with a marginal border of yellow widest at the bottom. Mouth parts brown. Two yellow stripes form a V in the centre of the face.

The pupa is large with laterally expanded wing-cases; the shoulders are prominent while the abdominal segments, especially the third, project in the form of a hump. The cremaster is stalked and supported at the base by two series of rounded protruberances. The ground colour of the pupa is olive-green ornamented with wavy enamel-like white markings, especially on the wing scutæ.

DISTRIBUTION:

Ansorge's *Euxanthe* ranges through the forests of Uganda to those of the Nandi Escarpment. It is entirely a forest species which keeps to the denser parts, frequenting the shady hollows frequently in



A.

PLATE XLV.

B.

Under and Upper surfaces of ♂ and ♀ *Euxanthe eurinome ansellica*.

the vicinity of standing water. The males are commoner than the females and come to bait or damp mud in much the same way as do *Charaxes*.

Both sexes enter into the *Tirumala petiverana* mimetic association.

EUXANTHE EURINOME ANSELLICA, Butlr. Pl. XLV., figs. a & b.

Expanse: Male, 90-96 mm. General colour black with pale green markings. Abdomen orange tawny.

F-w: Velvety black, with slight rufescence at the base of the costa. The size of the spots somewhat variable but position constant. The average specimen is as follows: A sub-apico-marginal series of single spots duplicated in 1b extending from this cellule to 8, that of 2 considerably set in from the line; a short series of four passing obliquely through the cellules 4-7, followed by three linear marks beyond the apex of the cell, below and distal to which is an ovoid spot in 3; an irregular spot with dentitions on the anterior edge is present in the cell followed by a pear-shaped spot sub-basal in 2, followed by a double linear streak at distal end of mid-third of 1b, with a linear mark at mid-point in 1a. All spots pale green, the sub-apical one almost white.

H.-w.: Ground colour velvet black slightly rufescent at the costa; basal patch pale greenish occupying most of the cell, the bases of 2, 3, 4, and 5, and 1c; the veins heavily emphasised by black scaling. A row of large ovoid pale green spots traverses the black border at about mid-point, followed by a sub-marginal series of triangular internervular spots of the same colour. Very often there is a series of very small double spots internal to the sub-marginal series.

A variety of male *F. RADIATA*, VAR. NOV. (Pl. XLI., fig. a) has the area of 1a and 1b chestnut, with an extension of this colour between the basal green and the first series of spots; and has the sub-marginal row larger than normal and connected with the first row by graduated lines of green.

Underside: Male and female. The ground colour is ochreous-brown with the central area of the fore-wing blackish shaded with chestnut along the margins. The under surface of the female is more greyish-brown. The spots in both sexes are more pronounced and larger than above.

FEMALE:

Expanse 110 mm. Very like the male but the ground colour not so black, more brownish, the pale spotting larger and more bluish with a greater degree of bluish scaling in the fore-wing cell and most of 1a, 1b, and 1c in the hind-wing white or very pale blue. Upper surface of abdomen dark brown, underside tawny orange.

EARLY STAGES :

The eggs of this species are laid singly on the upper surface and near the mid-rib of the more mature leaves of the forest tree *Nkuzanyana* (Luganda). They are bright yellow in colour, 2 mm. in diameter, resembling those of other species of *Euxanthe*, being almost spherical with the top depressed and markedly fluted from the central dimple. In two days a brown mark develops at the rim of the depression, and the whole egg gradually turns black, the larva hatching out in from seven to ten days. It devours the egg shell before commencing to eat any green food. When newly emerged it is pale olive with a black head, which under a magnifying glass appears covered with fine papillæ. At this stage the body is immaculate but as the various instars are completed the body becomes greener and at the third moult white spots appear on the sixth and eighth segments. The head turns from black to brown and then to green. After each moult the horns are whitish but darken to a grey-brown. At all stages the larvæ prefer the mature leaves to the young shoots. The adult larva has a smooth, broad, somewhat flattish body, sage-green in colour with two raised enamel-like white spots on the segments afore-mentioned. These spots are oval and placed transversely; each spot has two black dots placed side by side in its centre.

The spiracular or body line is white and projects in a wavy line along the length of the body in the form of a frill. The anal end carries a strongly bifid tail which is white. In some specimens the horns, tail and frill are rusty red. The head-piece is circular in outline and covered with fine papillæ. A central groove, commencing between the two median spines passes downwards, and at about the centre divides into two, enclosing a triangular area just above the mouth parts. The ground colour is sage-green. From the upper end of the lateral quadrants there arises on each side a strong cylindrical horn with a slightly thickened end, greyish white in colour, covered with fine papillæ and with spines on the posterior and outer surfaces. These horns are 9 mm. in length and are directed out and up and slightly inwards. Two other strong horns arise from the top of the disc; these are broad at the base but taper abruptly to a fine point. They are 4 mm. long and carry lateral spines. Between these two and between them and the outer pair, there are short sharp branched spines. The edge of the facial disc is white from the base of the lateral horns to above the mouth. Two convergent lines pass from the upper horns to just above the mouth.

The pupa has a very deformed appearance, due to the prominent dorsal hump of the second and third segments, particularly the latter; the thorax is also prominent dorsally. The angles of the wing shoulders project, while the wing cases are flattened and extended



A.

PLATE XLVI.

B.

Under and Upper surfaces of ♂ and ♀ *Euxanthe wakefieldi*.

laterally. The colour is dark green, with a glazed surface ornamented with white marbling on the wing cases, the thorax and the head.

DISTRIBUTION :

This species is confined to the forests of Uganda from Toro to the Elgon district. It is quite plentiful in the deep shady recesses but the males will come out into the open when attracted by bait such as leopard droppings, etc. They are slow of flight and display themselves in the patches of sunlight which penetrate the gloom of the forests. The males are fond of settling on the festoons of dried creepers in the forest clearings.

Both sexes, especially the female, bear a strong likeness to their model *Tirumala petiverana*.

EUXANTHE WAKEFIELDI, Ward. Pl. XLVI., figs. a & b.

Expanse: Male, 80-90 mm. General colour black with green-blue markings. Sexes unlike.

F.-w. velvety-black, with a series of pale greenish blue spots (which when viewed from certain angles appear white) arranged as follows: a sub-marginal row of small dots placed internervularly in cellules 2 to 8, sometimes only present in 2 and 3; a sub-apical row of angled spots in 4, 5, and 6, sometimes with a small dot under the costa; a series of irregularly shaped marks placed obliquely across the wing from the sub-costal mid-point to just before the hind angle, divided up by the black-scaled veins. Apex of cell with a large spot, with occasionally a small dot at the base.

H.-w.: Black, tinged rufescent at the base of the costa; a large bluish white area fills most of the cell, the bases of 2, 4, 5, and 6. The black border carries three rows of green spots; very small sub-marginal internervular, internal to which are double spots in 1c, 2 and 3; and a row of large ovoid ones following the contour of the wing from 1c to 7, that in 1c double and small.

Underside: The ground colour of the F.-w. is blackish at the base shading to rusty along the costa and the apex. Spotting similar to above with two additional spots at the base of the costa and cell.

H.-w.: Ground colour rusty brown; spotting as above but more pronounced, with extra white spots in 8 and 9. Abdomen tawny orange.

FEMALE:

Expanse 100-105 mm. General colour black and white.

F.-w. black with very pale bluish white or white markings similarly placed to those in the male, but all spots larger; the sub-apical series is usually missing.

H.-w.: As in the male but hind patch more extensive and reaching almost to the inner margin. the second row of spots are larger and more pronounced and extend to area 8, whilst the sub-marginal series is often missing or obsolete. In many specimens the large spot in the forewing cell is continuous with the basal one.

Underside: Very like above but the bases of the costa of fore and hind wings chestnut; area 7 carries three white spots while 8 has two and 9 one.

EARLY STAGES:

The egg of this species does not differ from that of other *Euzanthe*. The food plant is known to the Baganda as M'ziru—a forest tree which is plentiful at the coast and extends to Mt. Kenia. In the first two stages the larva is similar to that of *E. e. ansellica*, but after the second moult the larvæ can be distinguished by their heads. In the final stage the larva is sage green with a red spiracular line heavily serrated on the lower edge, shading to white along the upper edge, and outlined with a fine line of black. The strongly bifid tail is white; while the sixth and the eighth segments are each ornamented dorsally at their anterior edge with a raised oval patch reddish in colour, outlined with black, each carrying two green dots set transversely.

The head is oval in outline with a serrated margin, carrying on its upper half four pairs of horns; the outer pair are long (10 mm.), cylindrical for the greater part of their length, becoming bulbous at the end. The entire surface is heavily papillated, and on the upper and posterior surfaces there are three sharp spines; in colour these horns are brownish, with the papillæ ochreous. They are directed outward and slightly upwards, and at the point of expansion are inclined more vertically upward. The second pair are short spines with lateral branches; the third are 5 mm. long, black at the base and brown to as far as the tip; they are laterally spined and covered with papillæ; the central pair are short and heavily branched. Below the outermost pair there are two much branched spines directed backwards. The facial disc is centrally grooved; sage green in colour with a wide yellow marginal border, widest above the mouth. From the bases of the third pair of horns ochreous lines pass down in a V to just above the mouth. The mouth parts are blackish-brown. The first thoracic segment is dorso-anteriorly red. The anterior-lateral aspect of segments 1 to 6 is crimson. The forelegs are ochreous while the suctorial ones are pink. The ventral surface of the insect is ochreous.

The pupa is large and green in colour with a high glaze. The inferior surface is almost straight, but the dorso-thoracic segments are prominent and keeled, while the abdominal ones, especially the second and third, are protruded in the form of a hump. The wing

cases are expanded laterally and much angled. The cremaster is long-stalked and arises from a base of rounded knobs, four anterior, three lateral, on either side. The dorsal surfaces of the second and third abdominal segments are mostly enamel white in colour, while the wing scutæ are decorated with wavy lines of the same colour. The facial mask is white below. A diamond shaped white line outlines the thoracic segment.

DISTRIBUTION :

Wakefield's *Euxanthe* is common at the Coast and at Dabida, and it has recently been found to extend to the forests of Meru near Mt. Kenia. It is a forest species, but many examples find their way into the shady cocoanut groves where their slow flight and brilliant colour make them conspicuous. The males are fond of sailing about in some sunny forest clearing and should two appear in the same spot they immediately attack and chase each other until one is forced to retire.

When at rest they sit with their wings tight closed and owing to their peculiar marking are difficult to see, especially if the resting spot happens to be some brown dead creeper. The males are considered to be associated in colour with the mimetic group centred round *Tirumala petiverana*, while the females with their marked black and white pattern come into the *Amauris niavius* and *A. ochlea* association.



GREY FOREST PIGEON.

(*Columba uncinata*.)

THE BIRDS OF KENYA AND UGANDA.

PART VI.

By

V. G. L. VAN SOMEREN, M.B.O.U., C.F.A.O.U., ETC.

FAMILY *COLUMBIDÆ*.

GENUS *COLUMBA*, Linn.

INTRODUCTION.

The Columbidae of Kenya and Uganda are from a popular point of view divisible into three main groups: true Pigeons, Doves, and Green or Fruit Pigeons. The Doves are usually further sub-divided into groups according to their natural habitat or some pronounced characteristic. They have several features and habits common to all; thus in the matter of nest building, all adopt a fixed pattern, viz., an open platform of twigs loosely laid together, with little or no lining; further the eggs of all species are uniformly coloured, white or cream, and one or two eggs form a normal clutch.

They have a wide distribution, being found from sea level up to 10,000 feet, inhabiting forest, plain and desert country.

They are of considerable economic value, as devourers of seeds of obnoxious weeds, but it must also be laid to their charge that they do considerable damage to, and feed largely on cultivated grain; the balance however is decidedly in their favour.

Columba uncinata, Cass. Grey Forest Pigeon.
Ref. Cassin, Proc. Acad. Philad. 1859, p. 145.
Type locality: Ogowe River Gaboon.

DISTRIBUTION:

The great forests of Uganda.

DESCRIPTION. MALE ADULT:

Head neck and upper part of mantle pearly-grey, with a slight pinkish wash on the lower neck; chin and throat pure white, or with a slight greyish tinge. Upper breast greyish-pink, lower breast a delicate vinous pink, gradually fading into the white of the abdomen and grey of the flanks.

Thighs pure white. Undertail coverts white. Mantle scapulars and lesser wing-coverts lead-grey, with bluish-grey margins to each feather imparting to these areas a scaly appearance. Greater coverts and outer-webs of secondaries uniform leaden-grey; primaries dark greyish black with leaden-grey edging. Back, rump and upper tail-coverts bluish-grey with lighter grey margins. Rectrices dark greyish-black with a diffuse pearly-grey or white band crossing each feather about $\frac{2}{3}$ in. from tip; the band on the central pair always pearly-grey.

Cere round the eye, dark red, slightly mottled; eyes crimson, or ruby; bill horn grey paler at tip of lower mandible; feet dull bluish-crimson or greyish-red. Wings 210-215 mm.

FEMALE:

Very like the male but the vinous blush on the breast not so marked; size slightly smaller.

JUVENILE:

This is unknown to us; nor is there any published description.

HABITS:

The Grey Forest Pigeon is an inhabitant of the great tropical rain forests of Uganda, and although its range extends from Uganda to the forests of Congo and Gaboon, it is not common anywhere. We have never encountered the bird in flocks, the largest number seen at one time being four. Indeed it is seldom that one actually sees the birds; their presence is only made known by the deep penetrating "coo" coming from the topmost branch of some commanding sentinel of the forest. The top strata of the forest seems to be their favourite habitat, but they will descend to the mid strata when certain fruit bearing trees prove an attraction. Like most pigeons, these birds lie up during the heat of the day, and are most active during the early morning and after four in the evening. Just before sunset, when the sun's rays lie parallel with the tops of the trees, one may see a male bird performing aerial evolutions which are remarkable as showing the wonderful powers of flight and control. The usual manœuvre consists of a rapid "take-off" from the topmost branch in an upward direction, a full application of brake force brought about by fanning and depressing the tail and depressing of wings, causing a sharp vertical ascent, followed by a complete turn, and a gentle glide down to the starting point. The downward glide is preceded by a clapping of the wings above the back. This display is more frequent during the mating season than any other. As regards the actual nesting of this bird nothing is known. The mating call is soft and carressing in tone.

Columba arquatrix arquatrix, Temm. & Kp. Yellow-billed Speckled Pigeon.

Ref. Temminck & Knip. Colombes, p. 11, pl. 5, 1809.

Type locality: Knysna, Cape Colony.

DISTRIBUTION:

The forested regions of Kenya and Uganda above 4,000 feet.

DESCRIPTION: MALE, ADULT:

Fore part of the head, cheeks and neck purple-grey, with a vinous bloom; hind part of crown to nape, pale grey. Feathers of the lower



YELLOW-BILLED SPECKLED PIGEON.

(*Columba arquatrix arquatrix*)

neck with dark triangular subterminal mark and purple-grey tips, those of the hind-neck being pointed and hackle-like; and those bordering the upper breast delicately shaded with pink and forming a breast band. Upper part of mantle, scapular and lesser coverts deep purple-maroon with a greyish bloom and white marginal spots on outer webs; rest of mantle purple maroon shading into dark leaden grey on the back and rump and lighter grey on the outer wing coverts. The long scapulars are purple-brown with a greenish sheen. Primaries and secondaries blackish, the former with very narrow pale edges. Lower breast, and upper abdomen leaden-grey with wide purple chestnut to maroon ends and one or two terminal triangular white spots; flanks and belly leaden-grey with purple brown margins; under tail-coverts lead-grey with paler margins. Upper tail-coverts and rectrices dark brownish-black with slight green reflections.

Bill and feet lemon-yellow; bare skin round eye pale yellow with orange dapplings. Eyes grey or yellowish-grey. Length of wing 215-235 mm.

FEMALE:

Very like the male but less spotted and more greyish. Eyes brown or grey-brown.

JUVENILE:

The nestling plumage is dull brownish, each feather tipped and margined with rusty brown. This dress gradually merges into that of the first year in which the fore part of the crown is dark greyish with rusty-brown tips, shading into dull greyish on the rest of the crown and nape. The rest of the head and neck are greyish with the chin washed with brownish. The neck feathers are dull hair-brown with tips of dirty whitish or ochreous. The mantle, scapulars and wing coverts are brownish, the feathers on the latter area with rusty edges and white tip, giving a barred appearance to the bend of the wing. Primaries and secondaries dull brownish; rump blackish; rectrices blackish-brown. Breast and abdomen dull greyish with slight purple wash and rusty-brown tips. A few whitish spots are present on the breast. Bill and feet dull yellow. Bare skin round the eyes dull yellow with greenish tinge; eyes greyish-pink or brown.

HABITS:

The Yellow-billed Pigeon is common and widely distributed over the highland forests of Kenya and the higher forests in Uganda; it apparently does not occur in the central province of Uganda though well timbered areas exist in this part. It is however plentiful in the western forests round Toro and Ruwenzori. The stronghold of the species is undoubtedly the alpine forests of the Mau and Kikuyu Escarpment and Kenia. One has to witness a flight of these birds in order to appreciate the immense size of the flocks which move about

from forest to forest as successive crops of fruit-bearing trees come into season. A certain number are permanently resident in a forest but their numbers are periodically augmented by the incursion of local migratory birds.

The species is very conservative in the matter of roosting places, and although the feeding ground of the moment may be some considerable distance away the birds will flight there in the early morning, returning to roost an hour or so before sunset. There are several trees which furnish heavy crops of berries beloved by these birds, the commonest ones being the Wild Olive, *Olea chrysophylla*, *Podocarpus gracilior*, various species of *Todalia* and *Teclea* especially *T. trichocarpa*, *T. viridis*, and *T. stuhlmanni*, and the minute black fruit of *Trema guineensis*, F'ha. It is of interest to note here that the last mentioned tree grows largely in the open country either self-sown or cultivated, and although this Pigeon is a forest one it will frequent the open cultivated country to feed on this fruit. They also feed on certain wild figs.

One's attention is frequently attracted to these birds by the noise they make when feeding; although a heavy bird, they do not hesitate to reach for and secure some tempting berry growing at the extreme end of a slender twig; they sidle along the twig until it bends almost to breaking point, but with the aid of flapping or outstretched wings they preserve their balance until the fruit is secured. The noise they thus make is audible at quite a long distance.

Like many other forest species this pigeon builds its nest in quite low trees; we have found them at heights varying from six to twenty feet up. The nest is usually composed of the minimum number of slender twigs placed across each other calculated to support the eggs and the sitting bird; so flimsy is the structure, that more often than not, one can see the eggs quite plainly from below. Though the nest itself is so flimsily built, it is usually placed on some strong horizontal fork, with a fair canopy of leafy branches above. The number of eggs laid is not constant—we have frequently found nests with only one egg, occasionally two—but I am inclined to think that the former is the normal. The egg is a pure semi-glossy white, and measures 40-40.5 x 30 mm. Eggs kept under observation hatched in 16 days. Both parents share in the brooding of the egg and the young. They are close sitters, but reckless in the way they leave the nest if disturbed; I have more than once seen the egg knocked out of the nest as the parent has hastily left it. Nests have been found from March to August and November.

The call is very like that of the Wood Pigeon in England, consisting of two long drawn-out notes followed by two shorter ones, thus, wh-o-o wh-o-o hu hu. They also have a whistling note which is made under stress or excitement.



HACKLED-NECK PIGEON.

(*Columba guinea guinea.*)

The courting habits are difficult to follow as what little display there is takes place in the tops of high trees.

From the sporting point of view these birds take a high place. They are swift and strong fliers and are amenable to being driven over guns if these be correctly placed between feeding grounds. To the single gun considerable sport can be obtained by taking the birds as they flight to the food tree in the early morning or about four in the afternoon. A more difficult type of shooting, and one which calls for accuracy and quickness, is walking through a forest and taking the birds as they fly from the tree. They make off with a clatter of wings which unfortunately frightens most of the birds in the immediate vicinity. Another method is "snap shooting" as the birds are driven across the narrow "rides" or fire breaks.

Columba guinea guinea, Linn. Hackled-neck Pigeon.

Ref. Linnaeus, Syst. Nat. 10th ed., p. 163, 1758.

Type locality: Guinea.

DISTRIBUTION:

In suitable localities in Kenya, through Uganda to western Ankole.

DESCRIPTION: MALE, ADULT:

Head and upper neck light grey, paler on the throat and above the bare patch round the eye; darker, more ashy on the hind part of the crown. Neck feathers curiously bifid, exposed part orange chestnut at base shading to iridescent greenish-grey at the forked ends. These forks are stiff and give the appearance of hackles. Breast, flanks, abdomen, vent and back, light grey, the latter shading into very pale grey or almost white on the rump, which in turn shades into the darker grey of the upper tail-coverts. Under-tail coverts as upper.

Mantle, scapulars, and most of the wing-coverts bright reddish-chestnut with a decided "bloom," the feathers of the last with conspicuous triangular white terminal spots; rest of the wing-coverts grey, those at the bend of the wing with terminal spots. Primary coverts and outer webs of secondaries grey; primaries and remainder of secondaries ashy-grey with narrow white margins at tips. Rectrices ashy-grey with a wide black terminal band and a less distinct narrow dark band at the line of the longest tail-coverts.

Bare skin round the eye carmine, slightly mottled; eye with double ring, outer red to crimson, inner ochre to pale yellow. Bill black or grey, cere and nostrils white. Feet light purple-grey to pinkish with a bluish tinge. Length of wing 215-235 m.m.

FEMALE:

Very like the male but smaller.

JUVENILE :

The first full feathered plumage is very similar to the adults, but the speckling on the wings is not so extensive and is tinged with ochreous; the feathers of the crown, nape and mantle are grey with rusty-brown tips, while the feathers of the lower neck are dull grey with rusty-brownish ends, not bifid. The rump and under-side are as in the adult but duller; the primary coverts, the secondary coverts, primaries and secondaries are broadly tipped with rusty-brown. Eyes pale brown; bill blackish; feet flesh-brown. Wings 200-215 mm.

HABITS :

This is one of the most conspicuous Pigeons in Eastern Africa, and certainly one of the most interesting, as it is easily domesticated and breeds freely in captivity and hybridises well with the domestic Pigeon.

Although widely distributed, these birds keep to certain types of country; the requirements seem to be a rocky sandy bush-veldt in the vicinity of cliffs or broken larval country such as is found in the Northern Guasso Nyiro country. The birds are thus fairly plentiful in northern Ukambani; Donyo Sabuk, on the rocky sparsely tree-clad sides of the Escarpment down into the Kedong; extending along through Naivasha and Gilgil scarps, to Baringo and South Rudolf, Suk, Turkana, and the Maragoli Escarpment, and Kisumu, and in suitable localities in Uganda, more especially the western districts. So far as I have been able to observe, these birds appear to take all their food on the ground, thus resembling the "Rock Dove" of Europe. In many other respects there is a close similarity. These birds are usually met with in pairs or small flocks of half a dozen, rarely more. They are remarkably confiding and allow one to come to quite close quarters before taking wing; even then they only fly a short distance before settling to feed.

Several pairs frequent the township of Naivasha, and the railway yard of Kisumu; these latter flight down from the Maragoli Scarpe with great regularity every afternoon about 4 p.m. They feed round the outspans on the edge of the Bazaar and then visit the railway loading sheds, the attraction in both places being the grain and simsim which has escaped during the handling of the bags.

The usual nesting site of this bird is in a cliff side or deep railway cutting, occasionally in the banks of a deep water-worn course of a river. Of recent years they have taken to nesting under railway bridges and in crevices in the walls of outhouses. Two eggs form the normal clutch, pure white in colour and measuring 24 x 32 mm. The breeding season is uncertain, but we have taken eggs in February to July and in November and December.

The courting habits of this species are almost identical with those of the domestic pigeon. When the breeding season is on, the males become pugnacious and defend their respective nesting sites with great vigour. During June of 1912, when camped on the Maragoli ridge above Kisumu, I witnessed a tussle between two cocks. They were sparring on a dead branch of a tree which overhung the cliff; neither would give way but clung to the branch and buffeted each other with the hard bend of the wing to such an extent that feathers flew in all directions. When one seemed to lose its foot hold, and overbalanced, the other attacked it with vigorous pecks of the beak accompanied by much wheezing and cooing. The usual line of defence seemed to be to lie on one side and raise the near wing to its fullest extent, and to bring it down half closed on to the aggressor's head when opportunity presented. This fight lasted fully ten minutes until the birds were exhausted, and they sat panting about six inches apart, neither being capable of striking another blow. They remained thus for quite a long time until the female, who had been sitting on a nearby tree, sailed out leisurly over the valley as though nothing untoward had been taken place near her. Her departure was the signal for a truce as both males followed in her wake to the feeding grounds below.

The call of this pigeon is rather a harsh, semi-guttural "coo," mostly uttered at dawn and before sundown during the off season, but at any time during the day when they are nesting. I have not heard them cooing when on the ground. These birds keep to the ground as much as possible, and even when frightened, they prefer to fly a short distance and alight on the ground rather than to perch on a nearby tree. On the Northern Guasso however, they perch on the Dom Palms as readily as on rocks. Jackson suggests that they nest on these palms; any way the point is worth investigating. Owing to the smallness of the flocks these birds do not offer a great deal of sport.

GENUS **TURUROENA**, Bp.

Turturoena delegorguei sharpei, Salvad. Kenya Bronze-naped Pigeon.

Ref. Salvadori, Cat. Birds, Brit. Mus. xxi., p. 329.

Type locality: Mt. Elgon.

DISTRIBUTION:

The forests of Kenya from the Coast to Mt. Elgon.

DESCRIPTION: MALE, ADULT:

There would appear to be two distinct adult plumages *not* referable to age. Forehead, cheeks, crown and earcoverts ashy-grey, the

latter two areas with metallic green reflections; nape and neck except at the front, metallic green with pronounced violet reflections, followed by a band of enamel white feathers in the region of the lower neck and interscapular area; the lower margin of this band with violet-bronze iridescence. Chin and front of throat grey, merging into the purple-chestnut of the lower throat and chest, these latter with a distinct greyish bloom. Mantle, scapulars, inner wing coverts and outer webs of inner secondaries coppery-chestnut with some greenish reflections; rest of wing slatey-black, slightly brownish on the inner webs of the primaries. Rump, upper tail-coverts and rectrices deep slatey-black with greenish iridescence; the tips of the rectrices slatey-grey. Lower breast, flanks, abdomen, and under tail-coverts ashy-grey. Eyes yellow, reddish-yellow or licac-red; bill blackish at base shading to bluish-horn at tip; legs and feet, red, purple-madder, or crimson.

The second marked plumage is as follows: Forehead and crown to posterior angle of eye, cheeks and throat ashy blue-grey; hinder part of crown and nape metallic green shading into violet and green on the lower hind neck. White band as in the other form but shot with green or violet according to light; interscapular region, scapulars and wings rich greenish-black, or dark slate-black with green reflections; rump, upper tail-coverts and rectrices greenish-black. Chest and upper breast delicate vinous-grey shading into grey on the flanks and abdomen. Length of wing 175-185 mm.

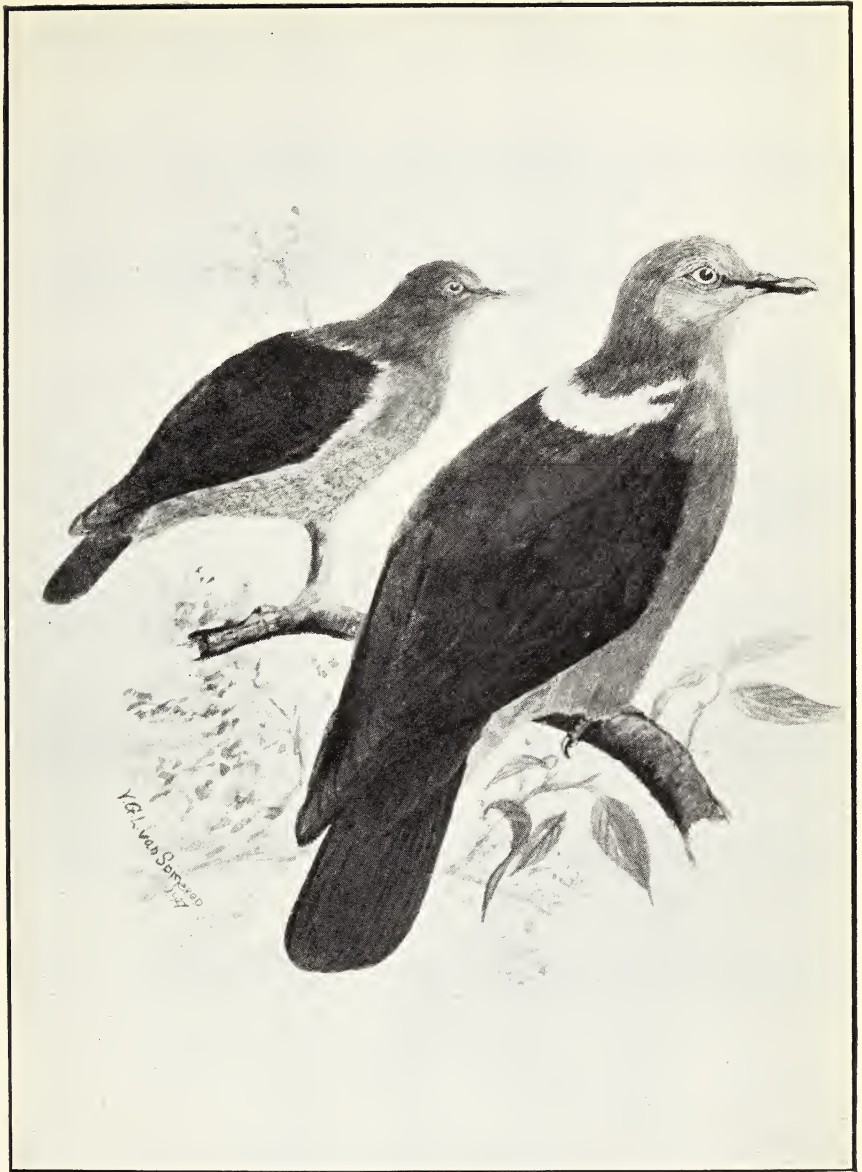
FEMALE, ADULT:

Forehead chin and throat, ashy-grey; crown, nape and hinder neck rusty-brown, the last shading into iridescent green shot with violet on the upper mantle. Cheeks and side of neck rusty-grey shading into slate-grey on the breast, flanks and abdomen; the feathers of the lower breast and abdomen with very fine ochreous freckling at the tips. Mantle, wings, scapulars and rectrices as in the second type of male. Length of wing 160-175 mm.

A second type of adult female occurs which differs in having the iridescent hind-neck band entirely violet; the upper breast tinged with brown, while the lower breast and abdomen are ochreous-grey finely freckled with lighter ochreous. The whole of the feathers of the upper surface are strongly edged with bluish and green reflections.

JUVENILE:

The nestling plumage is a dark brownish above, each feather with a wide terminal border of rusty brown bordered internally with a blackish bar. The head is greyish-brown with paler rusty tips to each feather. The undersurface is ochreous-grey with rusty terminal edges to the feathers of the abdomen and breast.



KENYA BRONZE-NAPED PIGEON.

(*Turturoena delegorguei sharpei.*)

The first full feathered plumage is as follows: Head ashy-grey with rusty tips; neck and throat greyish with broad terminal bars of rusty-brown; breast and abdomen rusty-ochreous with faint greyish barring; flanks and under tail-coverts slate-grey with wide terminal rusty-ochreous freckling. Mantle, scapulars, and wing-coverts, blackish-brown with marked rusty-brown tips and slight freckling. Rump and rectrices as in the female. If the young bird is a female the difference is in the head, which is greyish-brown with rusty tips, and the throat is a dirty whitish.

HABITS :

The Bronze-naped Pigeon is an inhabitant of the forests, in which it remains unless on local migrations in search of food.

This species is essentially confined to the forests of the higher altitudes, ranging from Kilimanjaro to Mt. Elgon, but I have both seen and obtained specimens in the coastal belt in the Sekoke Forest and on the Rabai Hills, but in these localities they are not permanently resident, though they visit these areas when a particular tree is heavy in fruit.

It is a species which is easily overlooked, and indeed were it not for its distinctive call, one might quite easily pass under the tree where the birds are perched without being aware of their presence. During the greater part of the day these birds "lie up" in the tops of the tall trees and are remarkably silent, but in the early morning they are active and take short flights over the tree tops, and give out their curious mournful call which is quite unlike that of any other pigeon or dove. It consists of two low coos followed by a shorter one and this, by one five notes higher, followed by five coos in rapid descending scale and diminishing volume with two long coos to end up. The only time when these birds are seen in numbers is when they leave the forest to feed on the small black fruit of the "Sandpaper" tree (*Trema guineensis*, Ficalho: Kikuyu name, *Muhethu*; *Ulmaceæ*). These berries are produced in clusters at the axils of the leaves, in quantities so that quite a small branch may be weighted down. They are highly attractive to all fruit-eating pigeons and most frugivorous birds.

I have frequently counted more than twenty pigeons on quite a small tree; the fighting and scrambling which goes on to reach some special bunch of berries at the end of a slender twig is most ludicrous to watch. They come to feed in the early morning and late evening.

Owing to their rather scattered distribution and the fact that they do not go in very large flocks, these birds offer little or no sport to the gunner; one can of course get in a few shots as they either come to or leave any particular feeding tree, but as a game bird they are poor sport. Like most pigeons, the flight is rapid and direct. During

the courting season the male indulges in a mild aerial display which usually takes place of an evening.

The nesting season appears to start in March and extend to June, followed by a second breeding season in December. The nest is of the usual pigeon type, a shallow platform of twigs placed in some horizontal fork about 15 to 20 from the ground. The eggs are pure white with a slight gloss and measure on an average 30 x 22 mm. Two eggs form the clutch. Both parents take part in incubation and feeding the young.

GENUS **STREPTOPELIA** Bp.

Streptopelia lugens funebrea, van-Som. Dusky Turtle Dove.

Ref. van Someren, Bull. B.O. Club xl., p. 21, 1919.

Type locality: Mt. Elgon.

DISTRIBUTION :

The Highlands of Kenya to Kilimanjaro.

DESCRIPTION : MALE, ADULT :

Forehead, cheeks, chin and upper throat pale pinkish buff shading into the grey of the crown, nape and neck; the first area shaded to dark grey on the hinder part of the crown. On either side of the neck a transverse patch of black feathers with narrow grey edges. Lower neck and upper chest grey shading into an area of vinous pink on the lower chest, this in turn shading into the pale grey in the abdomen and darker grey of the flanks, vent and under tail-coverts. Mantle and lesser scapulars ashy-brown with pale edges, merging into ashy-grey on the rump, followed by ashy-brown on the upper tail-coverts. Median and inner lesser coverts ashy-brown; marginal lesser coverts ashy-grey, all with pale edges giving a scaly appearance; tertials and longest secondary coverts ashy-brown broadly edged on the outer web with rufous and tawny-orange. Primaries and secondaries brownish-black with paler edges; all rectrices, except central pair which are ashy-brown, black with terminal grey bar; eyelids dark crimson; eyes golden-yellow, reddish-yellow or burnt-sienna. Bill blackish, nostrils madder; legs bright purple madder or reddish-lilac. Wings 175-180 mm.

FEMALE, ADULT :

Very like the male but smaller and paler below. Wings 165-175 mm.

JUVENILE :

The nestling plumage above, generally greyish-brown, each feather broadly tipped with buffy-grey; the under-surface buffy-grey paler on the throat and abdomen, barred with buff.



DUSKY TURTLE DOVE.
(*Streptopelia lugens funebrea.*)

The first full feathered plumage is somewhat like that of the female, above and below, but duller, with all the feathers tipped with buffy-grey especially those of the wings and scapular regions. The tertials are outwardly edged with rusty-brown while the primaries and secondaries are shaded with this colour on the edge of the outer webs and tips. The rectrices are coloured as in the female, but the tips are pointed, not rounded. The black feathers on the side of the neck are absent or very few in number.

HABITS :

The Dusky Turtle Dove is a bird of mixed habitat, that is, at certain times it is found in forest, at other it frequents the more open park country, and cultivations. The habitat is influenced by season, thus we find it in the neighbourhood of forest or wooded cultivations when the nesting season is on, but at other times it is seen in the open country. These birds are most in evidence when they flock during the " off " season; they then occur in large numbers, sometimes as many as forty to sixty individuals. They are essentially ground feeders, being especially partial to the seeds of a leguminous weed which grows up in fallow land. These flocks are composed of adult and young birds of the season; in many cases the latter predominate.

On one occasion during August when on safari in the neighbourhood of Lake Narasha, I saw an immense flock of these birds feeding on a small area of ground from which Sunflower had just been reaped; they were feeding on the fallen Sunflower seeds (crop examined). In the same district I obtained birds which had been feeding on wheat from a nearby field. Their staple diet however consists of seeds of no economic value, and bulbous roots; these latter are obtained in the dry veldt country and are actually dug up by the birds themselves. A few odd insects and molluscs enter into their diet. One frequently sees these birds in pairs out on the plains beyond Nairobi. They come to drink at about the same time each day; thus at one drinking place within the environs of Nairobi one may find these birds quenching their thirst at about 11 am. and at 3-30; between these times they roost in the trees surrounding the drinking pool. Quite a number take a final drink before settling for the night, that is after their return from foraging for their evening meal. This bird is fond of bathing, and at the above indicated spot one may see individuals taking a dip after their morning drink. If undisturbed they will sit on the rocks round the pool preening themselves, after which they lie on their sides with out-stretched wings and indulge in a sunbath. Their call consists of four coos, the first short, followed by a long one, four notes higher, and ending with two short coos two notes lower than the first. The notes are rather harsh, not rounded.

The nesting season is rather irregular, but at practically any time during the rains, either long or short, nest of this species may be found. My records show that eggs were found from March to June and in November. The nest is a frail structure of twigs rather loosely put together, but resting on some substantial platform, such as a horizontal fork; or where two or three slender branches cross each other.

I have frequently watched a pair nest-building; both birds collect material, but the bulk of the work is done by the male. On every occasion the dead twigs have been broken off by the birds themselves from trees in the immediate vicinity; on no occasion did they come to ground to collect material, though plenty of apparently suitable twigs lay about. The usual procedure was for the female to stand by the nest while the male brought the twigs and handed them over to the hen who placed them in position. If a twig fell to the ground while being manipulated, no attempt was made at recovery. Two eggs are laid, pure white in colour, measuring 23 x 32 mm. The young are fed until long after they have assumed full feather.

The only time when these birds offer any sport is when they are flocking at some favoured feeding ground. The shooting is however rather intermittent, for after the birds have been driven off and returned two or three times they become shy and refuse to flight.

I have had these Doves in my garden in a semi-domesticated condition for many years. They become very tame and stand capavity well if kept in a large aviary.

Streptopelia semitorquata semitorquata, Rupp. Grey-vented Ring Dove.

Ref. Ruppell, N. Wirbelth, Vog. p. 66, 1837.

Type locality: Taranta Mts, Abyssinia.

DISTRIBUTION :

Through Uganda and Kenya, except the coastal belt.

DESCRIPTION : MALE, ADULT :

Forehead pinkish-buff shading to pearl-grey on the fore part of the crown and grey tinged with vinous on hind crown. Chin creamy-pink shading into pinkish-buff with a vinous tinge on the upper throat, cheeks and ear-coverts; nape, lower neck, the whole of the breast and banks, rich vinous-pink with a grey bloom; abdomen, thighs and under tail-coverts leaden-grey. A half collar of black feathers on the back of the lower neck edged above and below with grey. Mantle, scapulars, back and inner wing-coverts ashy-brown with an olive tinge; marginal wing coverts shading to slate-grey. Primary coverts, primaries and secondaries blackish-brown with narrow paler edges to the tips and outer webs. Rump slate-grey shading into ashy-brown



GREY-VENTED RING DOVE.

(*Streptopelia semitorquata semitorquata.*)

on the upper tail-coverts. Rectrices, except the central pair, basal two-thirds blackish, shaded with greyish basally, thus forming a black bar before the terminal third which is dirty bluish-grey; the central rectrices are ashy-grey. Bill slaty-black; eyes usually with two rings, brown and red, brown and orange or yellow, brown and blue, crimson and orange, crimson and red. Bare skin round eye crimson; feet purple madder, crimson, or plum. Wings 175-192 mm.

FEMALE, ADULT:

Very like the male but smaller and with less vinous wash to the breast. Wings 166-180 mm.

JUVENILE:

Head, neck and breast sandy brown with broad paler tips to each feather; back and wings earth-brown with buff or ochreous tips. Wing feathers with rusty tips and edges; belly greyish sandy with rusty tips.

HABITS:

The grey-vented Ring Dove as represented by the two races inhabiting Uganda and Kenya, is one of the commonest species and is found from sea-level up to 10,000 feet. They are more of a forest species than most Ring-doves, but the bulk of their food supply is obtained in and around cultivations and settlements. I have on more than one occasion flushed a pair of these birds feeding in some open patch of forest land, or along a cleared firebreak. The presence of trees appears an essential feature of their habitat, but they are seldom found in the "thorn bush" country. They are found in practically all the larger settlements in Kenya and Uganda where trees have been planted up. They are essentially ground feeders, and when out foraging they frequent cultivations and gardens, not to destroy or pick up cultivated plants and seeds, but they feed almost entirely on seeds of noxious weeds and small land snails. It is true however, that when the native crops of Mtama, Whimbi and Mwele are ripe, and when they have been reaped and threshed in the native manner, dozens, sometimes hundreds of these birds flock to these threshing grounds and feed on the grain which has been scattered about. They drink and feed in the early morning and late afternoon. During the heat of the day they lie up in some shady tree and either sleep or attend to their toilet. At such times the birds are silent. They call most frequently just at dawn and at sunset but on bright moonlight nights I have heard them about eleven o'clock. There are two distinct calls, one a long low c-o-o c-o-o repeated several times; the other a repetition of this double coo followed by two shorter coos and ending with two notes like "did du." When the bird calls he sits in a huddled up position with the head drawn in and depressed; and

during the breeding season when courting is in full swing the calls are accompanied by simultaneous movement of the wings and spreading of the tail. The Grey-vented Dove becomes very pugnacious as the breeding season approaches; at such times one may often witness a couple of males in full battle, beating each other with uplifted wings with tremendous force; feathers fly in all directions but the combatants will not give in until entirely exhausted. Courting takes place either on the ground or in a tree; if on the ground, the cock chases the hen about and gives her little chance of feeding; actual pairing takes place either on the ground or in a tree. The nest is of the usual form, a frail platform of twigs placed on some horizontal fork or where two or three branches overlap. It is seldom placed high, usually 6-10 feet from the ground. The eggs are white and glossy, two in number measuring on an average 29 x 23 mm. Nests have been found in every month of the year, but the principal nesting seasons are from April to July, and again in November to January.

The coastal race has similar habits to its inland cousin. They frequent the cocoonut plantations, and frequently build their nests at the base of a branch. I have sometimes taken their nests in the low mangrove trees growing right out in the water.

***Streptopelia semitorquata minor*, Erl.** Coast Grey-vented Dove.

Ref. Erlanger, Journ. f. Orn., liii., p. 125, 1905.

Type locality: Umfudu, Gobwen.

DISTRIBUTION:

The Coastal belt of Kenya.

DESCRIPTION: MALE, ADULT:

In general type of plumage this race resembles that inhabiting the inland districts. It differs however in having the forehead and chin, white or cream, the former shading into the delicate pearly grey of the crown, the latter into a delicate rosy-grey of the cheeks and upper neck; the nape and the rest of the neck are a vinous pink with grey bloom, deepening in colour on the whole of the breast, but becoming a light pearly-grey on the flanks and abdomen, delicately washed with pink. Vent and under tail-coverts very pale grey. The mantle, scapulars and wings are much lighter in colour than in the typical form, with a decided greyish bloom over all; while the back and rump are light grey. The upper tail-coverts are a light greyish-brown as are also the central rectrices; the remainder of the tail feathers are greyish at the basal half, shading into black which forms a bar before the light greyish white tips. Eyelids, madder; eyes red and orange, or crimson and orange or yellow. Feet madder or plum. Wings 165-175 mm.



MASAI PINK-BREASTED DOVE.

(*Streptopelia decipiens perspicillata.*)

FEMALE:

Like the male but smaller; wings 160-170 mm.

JUVENILE:

As in the typical form but paler.

HABITS:

See previous race.

Streptopelia fulvopectoralis, Granvik. Nyanza Fulvous-breasted Dove.

Ref. Granvik, Journ. f. Orn., 1923 p. 54.

Type locality: Kendu Bay.

DISTRIBUTION:

South eastern shore of Victoria Nyanza.

DESCRIPTION. FEMALE:

This species has recently been described by Dr. Granvik from a single specimen. As the bird is unknown to me I give the description as it appears in the above-quoted reference. "The forehead is light grey-brown, the crown and occiput dark grey-brown. The sides of the neck light yellow-brown, cheeks grey, throat white. An indistinct black occipital band bordered at the top by a wide yellowish-brown band, fringing the dark grey-brown occiput. Back, scapulars, wing-coverts, upper tail-coverts and the two median rectrices earthy-brown, the latter being dark greyish-blue at the base. The primaries dark brown, the coverts of the secondaries and primaries black. The throat, the fore-neck and breast yellowish-brown, like the flanks. The belly and the under tail-coverts white. Lower wing-coverts brown, with dark patches here and there. The rectrices, except the median ones, earthy-brown with dark grey base and grey wash, tipped with white. Bill black, irides citron yellow. Around the eye there are naked parts with small, red wart-like formations. Feet pale red-lilac. Wings 144 mm."

MALE, unknown. JUVENILE, unknown.

HABITS:

"The bird lived in the dense bush and copse vegetation bordering the shores of Victoria Nyanza in the Kavirondo country."

Streptopelia decipiens perspicillata, Fisch. Reich. Masai Pink-breasted Dove.

Ref. Fischer & Reichenow, Journ. f. Orn., xxxii., p. 179, 1884.

Type locality: Nguruman, T.T.

DISTRIBUTION:

The country between the south of Victoria Nyanza to Kilimanjaro.

DESCRIPTION: MALE, ADULT:

Front part of head and cheeks light grey, shading to white on the chin and throat; hind part of crown and ear-coverts greyish washed with pink, shading to vinous pink on the nape sides of neck and breast; on the lower hind neck a broad black collar edged above with white and below with vinous. The pink of the breast shades into white on the belly and into light grey on the flanks. The vent and under tail-coverts are white, the latter with a greyish tinge along the shafts. Mantle, scapulars, tertials and most of the inner wing coverts ashy-brown with a greyish bloom; the outer or marginal wing-coverts and outer secondaries grey; primaries and inner secondaries blackish-brown paler on the outer webs and with pale edgings. Back, rump, upper tail-coverts and central pair of rectrices, earthy-brown with a grey wash on the rump; rest of rectrices dark greyish black at the basal half shading to black distally, the terminal third of the feathers dirty greyish fading to white at the tips. Bill black; eyelids red, eyes ochre to pinky-yellow; feet lilac-red or lilac-madder. Wings 155-168 mm.

FEMALE:

Similarly coloured but smaller. Wings 148-160 mm.

JUVENILE:

This is unknown to me.

Streptopella decipiens permista, Reich. Uganda Pink-breasted Dove.
Ref. Reichenow, Vogel Af., p. 808, 1905.
Type locality: Maliwungu, T.T.

DISTRIBUTION:

In suitable localities in Western Uganda, south shore of Lake Victoria.

DESCRIPTION: MALE, ADULT:

Crown, cheeks and ear-coverts, ashy-grey inclining to white on the throat; neck and breast deep vinous shading to greyish on the flanks, and whitish on the abdomen; thighs, vent and under-tail-coverts, light grey, the feathers of the latter white tipped. A black collar is present on the hind neck, bordered above and below with whitish. Mantle, scapulars, inner lesser coverts and tertiaries ochreous-grey-brown inclining to greyish on the marginal coverts and outer secondaries of the wing. Primary coverts blackish-brown. Primaries and secondaries blackish-brown with pale edges. Back, rump and upper tail-coverts like the mantle; slightly more greyish on the rump; rectrices, two central pairs ashy-grey-brown, slightly darker basally, remainder blackish-grey at the base distally inclining to black; the terminal third pale ashy shading to white at the tip. Eyelids

red; eyes orange or yellow, bill blackish-grey, nostrils grey; feet purple madder to lilac. Wings 150-168 mm.

FEMALE:

Very like the male but with less vinous on the breast, and smaller.

HABITS:

This bird and the form *perspicillata*, are similar in habits and are here treated together. They appear to be somewhat restricted in distribution and to require certain conditions such as are found in dry hot districts where, however, there is an abundant water supply; thus one finds the race *permista* along the south and western shore of Lake Victoria, and the other in such places as the banks of the Northern Guasso Nyiro. These birds are more associated with the bush country where there is plenty of open bare ground, rather than in areas which are populated; one seldom sees them in townships though at Kisumu for instance they will visit the railway yard after loading has ceased for the day, to pick up any fallen grain which may have been scattered about. In this particular district one finds them actually along the lake shore roosting on the ambatch trees which grow out in the water, or at feeding time, frequenting the native cultivations. One may usually count on seeing them in fair numbers on patches of ground where Wimbi or Simsim has been grown.

The nest is of the usual pigeon type, usually built in some low bush, but I have taken the nest of *permista* placed in a dense clump of Papyrus growing well out in the water. There used to be a particular patch of ambatch trees growing in the middle of a large papyrus swamp at the head of Kavirondo Gulf, where at practically any time of the year one could find half a dozen nests of this bird.

Along the Northern Guasso Nyiro we found *perspicillata* nests built on the Dom palms as well as in bushes.

***Streptopelia decipiens elegans*, Zedlitz.** Juba Pink-breasted Dove.
Ref. Zedlitz, Orn. Monatsb, p. 59, 1913.
Type locality: Afgoi, S. Somaliland.

DISTRIBUTION:

Jubaland to the Northern Frontier.

DESCRIPTION: MALE, ADULT:

Very like *S. d. perspicillata* but paler throughout. Chin, throat and forehead white, shading to pearly-grey on the cheeks and crown, the hind part of the crown washed with vinous; the nape and upper part of the hind-neck and the chest, a delicate vinous-pink fading to white on the breast, abdomen and flanks, the last with just a wash of pale grey. Under tail-coverts white. A black collar outlined above and below with white is present on the lower hind neck.

The mantle, scapulars, tertials and lesser wing-coverts pale earthy brown shading to paler brown on the median coverts, and to pale grey on the marginal wing-coverts and secondary coverts. Primaries and secondaries earth-brown, with pale edges to the outer webs, especially on the secondaries. Back, rump, upper tail-coverts and central pair of rectrices like the mantle, the rump slightly washed with grey. The rest of the rectrices dark greyish at the basal half shading to blackish before the terminal third, which is white shaded with faint grey proximally. Bill greyish-black; bare area round the eyes pink, eyes pale creamy with a pinkish tinge; feet light purple madder. Wings 145-156 mm.

FEMALE:

Like the male but duller, and smaller.

JUVENILE:

Unknown to me.

HABITS:

The Juba pink-breasted Dove is a pale desert form of *decipiens*, and is similar in habits to others of this species. It is rather more addicted to desert land away from native settlement. At most times they are seen in pairs in the desert and bush country, but congregate in flocks when coming to water; at such times they associate with Reichenow's Dove.

***Streptopelia capicola tropica*, Reich.** Uganda White-vented Ring Dove.

Ref. Reichenow, Orn. Monatsb., p. 139, 1902.

Type locality: Songea, T.T.

DISTRIBUTION:

Throughout Uganda east to Elgon and south to Kenya above 5,000 feet.

DESCRIPTION: MALE, ADULT:

Crown grey, paler on the forehead and deepening in shade towards the occiput; a black loreal streak from the gape to anterior angle of the eye; chin white shading to vinous pink on the throat, cheeks and side of head; with a deeper shade of vinous on the back of the neck and lower throat, this, in turn, shading to vinous-grey on the breast and flanks, the latter more washed with grey. The abdomen and under tail-coverts are white. A black collar, outlined with white, is present on the hind-neck. The mantle, scapulars, all the wing coverts except the marginal ones, ashy-grey-brown; the back and rump, and upper tail coverts ashy-grey, slightly paler laterally; three inner pairs of rectrices ashy-grey, remainder deep grey at the base, pale grey shading to white at the tip; outer web of lateral pair, white.



WHITE-VENTED RING DOVE ON NEST.



Secondary, median and marginal lesser coverts light grey; primaries blackish brown; secondaries ashy-grey with pale margins. Eyelids red; eyes light to dark brown; bill black; feet lilac-madder to purple-madder. Wings 150-160 mm.

FEMALE:

Like the male but smaller.

The above description applies to the average bird inhabiting the countries of Uganda and Kenya north west of Mau. South of this, from between 6,000 to 4,500 feet occur birds which are intermediate between the race *tropica* and *somalica*. They are paler above and below and thus approach the Somali form but they are not true *somalica*. The birds inhabiting the coastal belt and the bush-veldt zone are nearer to this form but even they are not like the Jubaland race.

JUVENILE:

Head and breast pale ochreous-grey paler on the forehead and throat and belly; the whole of the back a deeper ashy brown; wings more or less as in the adult, but the feathers throughout edged with pale dirty white or ochreous; the primaries are tipped with rusty red.

HABITS:

This race is found between 4,000 and 6,000 feet, occasionally higher. For the most part it is a bush, and park-country bird, and seldom enters forest. It is plentiful in the bush round Naivasha extending through similar country up to the foot-hills of Elgon. In Uganda we have found it common in the neighbourhood of villages and cultivations, mostly in pairs or small parties. They are entirely ground feeders and though undoubtedly taking a small amount of cultivated grain, their staple diet consists of seeds from wild plants. They are also very fond of small land molluscs which they obtain in the shady damp ground in the banana groves.

Like many other species of Doves, these birds have, to quite a marked degree, associated themselves with humans; thus we find them one of the features of townships which have been established within their range. Nakuru is a case in point; nearly every garden has its pair of doves which feed among the fowls; some have even taken to nesting on ledges under verandahs, and in creepers growing up the walls of the houses.

In the wild this bird usually builds in some low bush or tree; in the Kisumu district a favourite site is a triple fork of a *Euphorbia* branch. The nest is a shallow platform of twigs and roots, with a fair central depression. The clutch consists of two pure white eggs averaging 28 x 23 mm. in size. I have more than once taken a nest, at the top of a *Papyrus* stalk.

Both parents take part in the construction of the first portion of the nest, but when the ground work has been laid the male collects the material while the female lays it in position. Both birds feed the young. Dove shooting is rather disappointing at the best of times, and these birds are no exception to the usual; a few shots may be had at birds put up from feeding grounds or from trees, but as there is so regular flighting, shooting becomes spasmodic; the flight however is swift and strong.

The call note of this Dove is distinctive, and may be rendered thus: Coo kurroo, coo kurroo, repeated twice or thrice, the first note long, the second double one ending somewhat abruptly. The Kavirondo name for this bird is Akuroo; entirely phonetic.

Streptopelia capicola somalica, Erl. Somali White-vented Ring Dove.
Ref. Erlanger, Journ. f. Ornith., liii., p. 127, 1905.
Type locality: Sarigo, S. Somaliland.

DISTRIBUTION:

Jubaland and the Kenya littoral inland to the Taru desert.

DESCRIPTION: MALE, ADULT:

Very like the race *tropica*, but smaller and paler throughout. The crown pale grey to the nape, inclining to white on the forehead. Cheeks, neck and breast pale pinkish-grey, paler on the throat; the pink of the breast shading into the very pale vinous-grey of the flanks and the white of the abdomen. Vent and undertail-coverts white. Mantle scapulars and tertials, pale ashy-grey-brown; most of the lesser wing coverts pale grey, those of the secondary coverts edged with white. Primary coverts black; primaries and secundaries dark ashy-brown, with narrow edges to the outer web. Back and rump grey, shading to ashy-grey on the upper tail-coverts. Rectrices, middle pair ashy-grey, next pair grey, the third pair paler grey at base shading to white at the tip; two next pairs grey at basal two-thirds, shading from very pale grey to white, outermost pair dark grey at the basal half of the inner web, but tending to black just before the white tip, outer web entirely white. Soft parts as in the other race.

FEMALE:

Smaller but otherwise like the male.

JUVENILE:

Dress as in *tropica*, but paler throughout, more greyish.

HABITS:

In general habits this race resembles the preceding, but the habitat differs somewhat in character. It is limited to the dry bush-veldt and

thorn country, where one usually sees them in pairs or small parties. It is a common bird and often associates in large flocks when the crop of some particular seed is ripe. They avoid the thick grass country and keep rather to the dry country where vegetation is sparse, nevertheless when an area of grass-land has been burnt off several scattered flocks may be seen feeding here and there. They are most active during the morning and evening, spending the hours of noon perched in some shady trees often in the vicinity of water. Along the Coast littoral one finds these birds frequently the neighbourhood of native villages and cultivations, retiring to the groves of Coconut palms to roost.

The nest and eggs of this race are indistinguishable from the preceding. In the thorn bush country, we have usually found the nest in some low tree about ten to fifteen feet from the ground, but at the coast I have not infrequently located them at, or towards the base of a frond of a coconut tree; sometimes in a Mango tree quite thirty feet up. The eggs are white and semi-glossy, averaging 25 x 22 mm.

Streptopelia vinacea barbaru, Antin. Pink-faced Dove.

Ref. Antinori, Cat. di Uccelli, p. 89, 1864.

Type locality: Sennar, White Nile.

DISTRIBUTION:

Uganda, in suitable localities.

DESCRIPTION: MALE, ADULT:

The whole of the head and neck to upper breast, vinous pink, slightly paler on the chin, and tinged with grey on the posterior aspect of the crown and nape. A black line runs from the gape to the anterior angle of the eye. On the hind-neck there is a broad black collar edged above with pale grey. The whole of the breast is vinous pink shading to white on the abdomen and vent, and to slaty-grey on the flanks. Mantle, scapulars, and inner wing-coverts, ashy-ochreous-brown shading to greyish-brown on the rump and upper tail-coverts. Central pair of rectrices like the upper tail-coverts, the next two similarly coloured on the outer webs, grey on the inner, the remainder with basal $\frac{3}{5}$ blackish-grey, with white ends increasingly shaded with light grey from without inwards; the outer pair with white margin to outer web. Under tail-coverts white. Lesser coverts on the outer side of the wing, greyish; and secondary coverts, primary coverts blackish; secondaries and primaries greyish-brown with narrow paler edges. Eyes brown; bill slaty-grey to black; feet bluish-lilac to pink-grey. Wings 135-155 mm.

JUVENILE:

Unknown to me.

HABITS :

This species of Dove extends into the northern districts of Uganda from the Sudan, but according to Jackson the southern limit appears to be at Mubendi. It is very like *S. capicola tropica*, but can be distinguished from that bird by its smaller size and its much pinker head. In habits they are alike, but the call note of the "barbaru" is distinctive; Stoneham likens it to the words "what about it?"

It is fairly plentiful in the northern area of its range, and is usually seen in pairs or small flocks in the vicinity of old cultivations or in patches of Sorghum or Mtama. The nesting habits are similar to *S. c. tropica*.

Streptopelia reichenowi, Erl. White-winged Ringed Dove.

Ref. Erlanger, Orn. Monatsb., p. 182, 1901.

Type locality: Salakale, Juba River.

DISTRIBUTION :

Jubaland, particularly the northern districts.

DESCRIPTION : MALE :

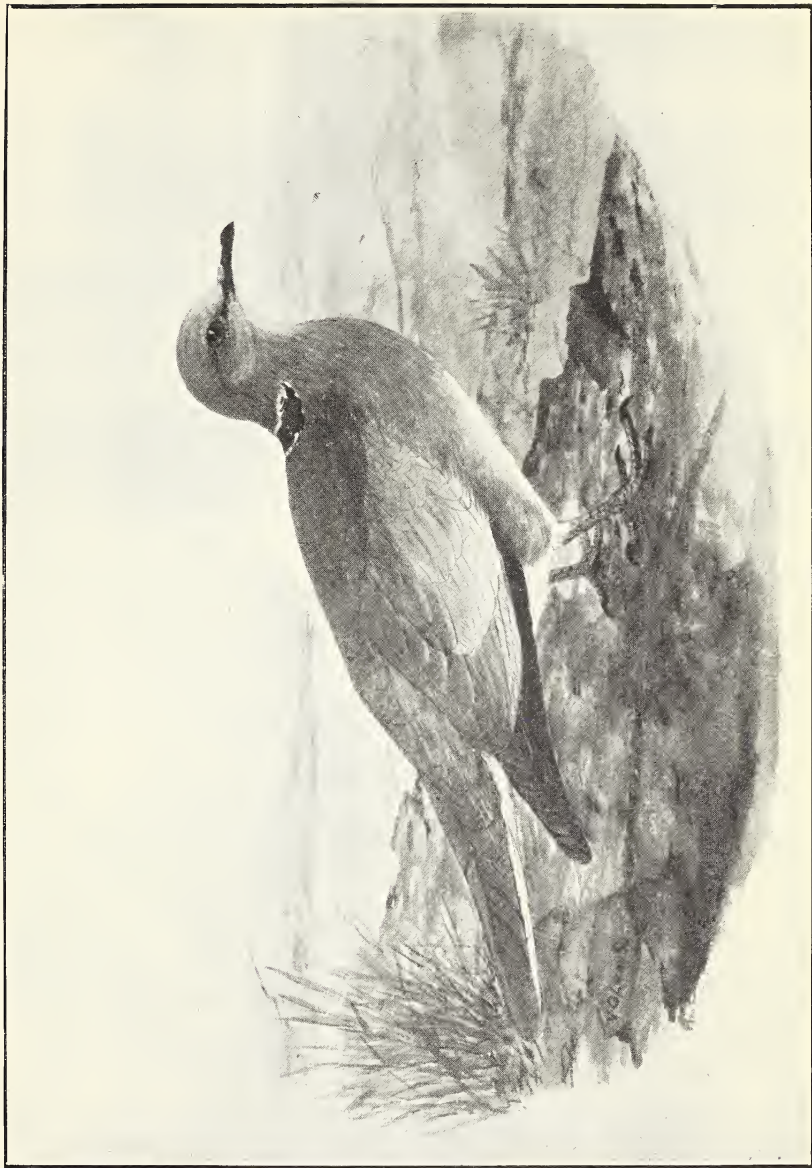
Entire head, neck and breast light bluish-grey, slightly darker on the head, and inclining to white on the throat. The grey of the breast gradually shades away to whitish on the flanks and on the lower breast and abdomen becomes pure white. Vent and under tail-coverts white, the shaft area of the longer feathers slightly tinged with grey. A sharply defined black neck band is present on the hind neck, edged particularly distally, with white. Mantle and scapulars ochreous-ashy grey, shading on the wing to a more greyish colour on the secondaries, secondary coverts and lesser coverts; then merging to pale grey through to white on the rest of the wing coverts, the edges of the outer webs of the secondary coverts, and secondaries. Primary coverts black; primaries blackish-brown with narrow pale edging and tips to the three outermost. (The dark primaries contrast strongly with the white-edged secondary coverts.) Back and rump to upper tail-coverts and two central rectrices, greyish-ashy-brown, tinged with grey on the rump and rectrices; third, fourth and fifth pairs ashy-grey at the base, with an increasing degree of shading, from without inwards, from the white tip to the mid-point. Eyelids crimson; eyes red, or orange to brown; bill black; feet red to purple madder. Wings 136-146 mm.

FEMALE :

Like the male in colour but smaller; wings 132-140 mm.

JUVENILE :

Head, ashy-grey like the breast and flanks; throat and sides of head buffy grey, all with pale tips to the feathers; mantle scapulars



WHITE-WINGED RING DOVE.
(*Streptopelia reichenowi*.)

and wing-coverts ashy-grey-brown, with dark centres to those of the last two areas, and all with pale buffy tips. Marginal wing-coverts and secondary coverts leaden grey, rest of wing feathers ashy-brown, with rusty and buff tips and edges.

The next plumage is similar to the above, but there are no light tips to the feathers and a black collar is present on the hind neck.

HABITS :

The White-winged Ring Dove is very local in its distribution and has not been recorded outside the Northern Frontier area and Jubaland (so far as Kenya is concerned). It is a common species along certain parts of the Juba River but less frequently met with in the desert country to the west. In the latter area they occur in pairs but when they come to drink at some waterhole they congregate in large numbers. They usually arrive some time before the advent of Sand-grouse and scatter when these birds appear. I am told that in localities where the only water supply is from deep wells that these birds actually descend there, in order to quench their thirst, and that it is a wonderful sight to watch them going down in twos or threes to drink from the limited foothold offered by the niches cut into the face of the well during construction.

Practically nothing has been recorded regarding the habits of this species, and I have no information in connection with nidification, etc.

GENUS **STIGMATOPELIA**, Sund.

Stigmatopelia senegalensis aequatorialis, Erl. Speckle-necked
Laughing Dove.
Ref. Erlanger, Orn. Monatsb., p. 98, 1904.
Type locality: Menaballa, Abyssinia.

DISTRIBUTION :

Throughout Kenya and Uganda.

DESCRIPTION : MALE, ADULT :

Head, neck, and breast deep purply-vinous grey, paler on the throat, and tending to creamy white on the abdomen, and to grey on the flanks. Vent and under-tail-coverts white. Around the front and the sides of the lower neck is a speckled collar composed of bifid feathers which are black at the basal half and orange-vinous at the tips, the black bases showing through the bifid ends. The hind neck is washed with grey, while the mantle and scapulars and inner wing coverts are greyish with broad rusty brown ends; rest of the wing coverts and outer webs of the secondaries leaden-grey; primaries and primary coverts blackish with narrow edges to the outer webs. Back and rump leaden grey, shading to ashy-grey-brown on the upper tail-

coverts and the central pair of rectrices; the next pair of tail feathers are ashy-grey, slightly darker at the basal half; the three outer pairs black at the basal half, white distally, with a graduated amount of grey tinge, increasing from without inwards. The eyelids are red while the eyes are dark brown; bill black with grey nostrils; feet purple-madder to lilac. Wings 130-145 mm. The sexes are alike for the most part, but the females tend to have less rusty brown on the back.

JUVENILE:

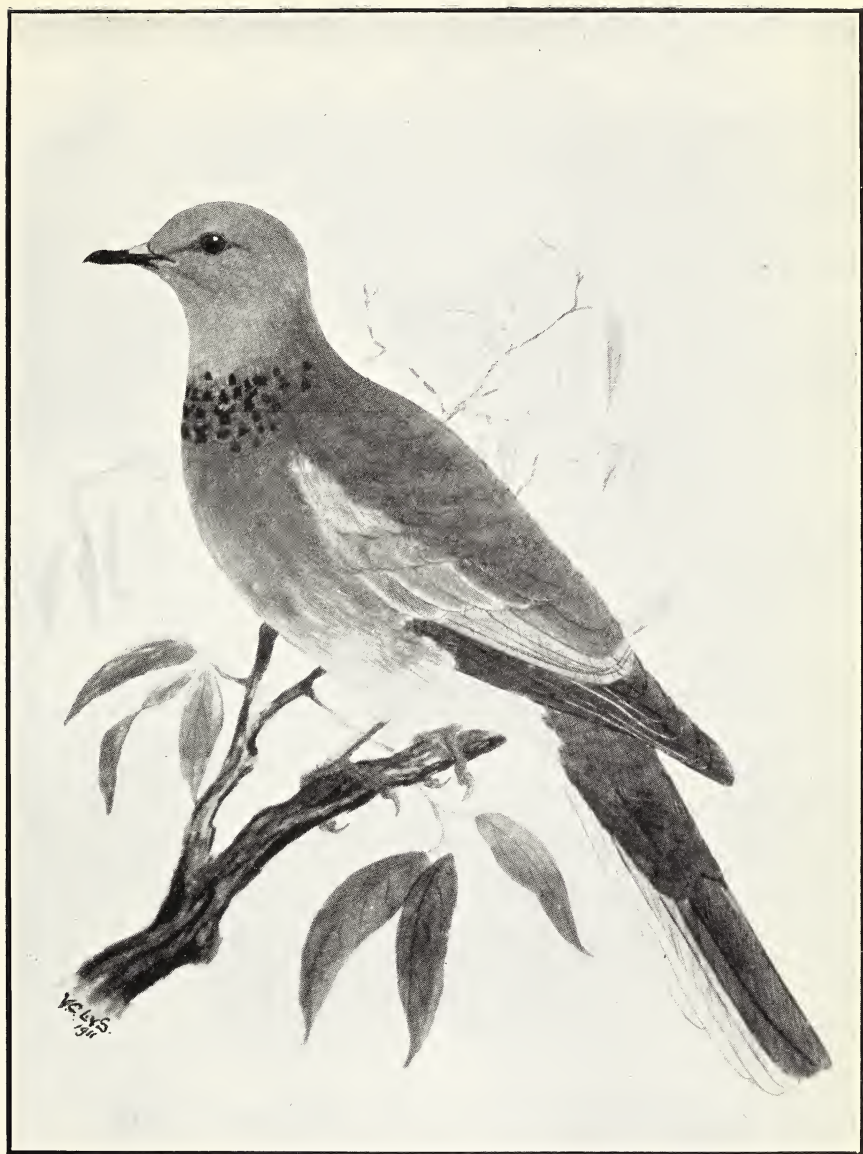
The nestling is sparsely covered with yellowish hairy down. In the first feathered plumage the head, neck and breast are ashy ochreous with paler buffy tips to the feathers; the mantle, scapulars back and rump to the upper tail-coverts, ochreous ashy-grey with paler ends, the majority of the wing coverts are grey, buff tipped; and the primaries brownish black with rusty tips and edges. The lower breast and abdomen are dirty whitish tinged with ochreous.

HABITS:

The Laughing Dove, so called because of its peculiar call, is widely distributed and common through Uganda and Kenya, inhabiting districts which are cultivated or covered in scrub and thorn-bush, but seldom being found above 6,000 feet. It is entirely a ground feeder and may frequently be seen feeding along roads, taking little or no notice of pedestrians and merely flying out of the way of a passing vehicle to alight again almost immediately. On most occasions one sees them in pairs or small family parties, but at certain times of the year they congregate in large flocks. In certain townships such as Jinja and Kampala they take the place of the English house Sparrow, being as tame and as plentiful and taking little notice of passers-by, merely fluttering a foot or two to avoid being trodden on.

Away from habitations these birds are less tame, but in the Native Reserves where such grain as M'wimbi and M'wele are grown, one can count on finding large associations when the harvesting and threshing season is on. At such a time one can obtain fair shooting, taking the birds as they come and go.

The regular nesting season is between the months of April and August, and again in November to January, but a certain few semi-domesticated birds have been known to breed at any time during the year. The nest is usually built in a low bush or tree not more than 10 feet from the ground. It is of the usual type, a shallow structure of twigs loosely put together, with practically no lining twigs to speak of. Two eggs usually form the clutch, but on more than one occasion I have taken three eggs from a nest. They are white with a semi-matt surface, and measure on an average 25 x 21 mm. Birds which



SPECKLED-NECK LAUGHING DOVE.

(*Stigmatopelia senegalensis aequatorialis.*)



SPECKLED-NECK LAUGHING DOVE FEEDING YOUNG.



SPECKLED-NECK LAUGHING DOVE AT NEST.

habitually frequent a garden are very conservative in their choice of the nesting site; thus, I have known a pair to select the same tree for eight seasons in succession, and even though the first nest was destroyed the birds built in practically the same position within a day or two. The call consists of a high kruo kruo repeated four or five times ending with a chuckling note rapidly repeated who-oo-o-o-o-o-o.

The mating display is interesting; the male approaches the hen with a soft cooing note and bobbing of the head accompanied by blowing out of the crop; if the female accepts attention they bill and coo for a second or two then the male flies up from the branch almost vertically with rapid clapping of the wings above the head, then when a sufficient height has been reached he sails round with outstretched wings circling the hen once and then alights beside her, with a chuckle, after which they both coo softly and bill each other.

FISHING IN THE KAVIRONDO GULF, LAKE VICTORIA.

By C. M. DOBBS.

HISTORY OF THE INDUSTRY.

Although fishing by natives along the shores of the Gulf has been carried on from time immemorial, it was only in 1905 that the fishing industry proper was started by Mr. Aarup, a Norwegian, who found by experience the best size and kind of nets to use.

Mr. Aarup, who was almost blind, appears to have done a lot of pioneer work in the industry, and definitely proved that the best mesh was what is known as the 5 inch. This gives a mesh of about 2 inches square. At first shoemakers' twine was made into nets locally, but this was not successful partly owing to the inferior lasting qualities of the twine and partly owing to the slipping of the knots which allowed the fish to escape. Trials were also made with cotton nets of thicker thread. These nets however took no Carp (Ngege and Mbiru) but caught Kisinga (Fwani). Subsequently nets were obtained from Messrs. Wm. Barbour, Lisbourn, Ireland, and these were found so successful that they ousted all the locally made articles and are the only sort used at present. *These nets are sold in the Kisumu Bazaar at a price of Shs. 17/- to 18/- and are 100 yards long, 5 inch mesh and 26 mesh deep, 35 twine three ply. They are of a drab colour and the thread is very fine. White and tanned nets are useless. Trials were made with thicker twine (No. 20) but the catches were small.

The average life of a net is said to be about 20 days, but in the hands of Europeans they have a longer life and sometimes last up to two or three months unless they meet with accidents as when a crocodile gets entangled in them.

In 1921 when the industry was more flourishing than it is to-day up to 20,000 nets were imported annually from Ireland.

RESTRICTIONS:

The use of nets with a mesh of under 1 inch square is forbidden by law. Trawling is also forbidden except in water of 16 feet and over, and at a distance of not less than a quarter of a mile from the shore; this means that trawlers cannot be used in the Gulf as it is all very shallow.

* A large number of nets are also supplied to the Kisumu Bazaar by Messrs. Joseph Gundry & Co., Bridport. There is also a certain demand for White Nets.—*Editor*.

LAWS AND REGULATIONS :

The law in regard to fishing in Lake Victoria is contained in an enabling Ordinance entitled The Fish Protection Ordinance, 1908 (Caps. 163 Laws of Kenya) and regulations promulgated at various times by His Excellency the Governor. This Ordinance gave the Governor power to regulate fishing, impose fees and registration of boats, issue licences and determine times of fishing. The first rules published under the Ordinance were the Victoria Nyanza Fish Protection Rules, 1914, Government Notice No. 123, page 682 of the *Official Gazette* for 1914. These rules were applied to all that part of the Lake Victoria lying within the then East Africa Protectorate and to the mouth of every river. It contained the following Regulations :

- (1) All persons fishing for sale or barter were required to register yearly. The fee was 300/- for all non-natives of Africa. No fee was charged for natives.
- (2) All registered fishermen were required to register all boats, nets and stakes.
- (3) No mesh was to be less than 1 inch square.
- (4) Trawling was prohibited nearer than quarter of a mile from the shore and in water less than 16 ft. deep.
- (5) No nets or stakes were to be placed in a fairway.
- (6) Fishing grounds with nets to be buoyed.

Later in the year the Victoria Nyanza Fish Protection Amendment Rules were promulgated (Government Notice No. 181 of 3/8/14 *Official Gazette*, page 864). These defined " natives " as being South Kavirondo, Kisumu, and North Kavirondo natives and any other natives of African not of European or Asiatic origin who are in the employment of a non-native who is duly registered.

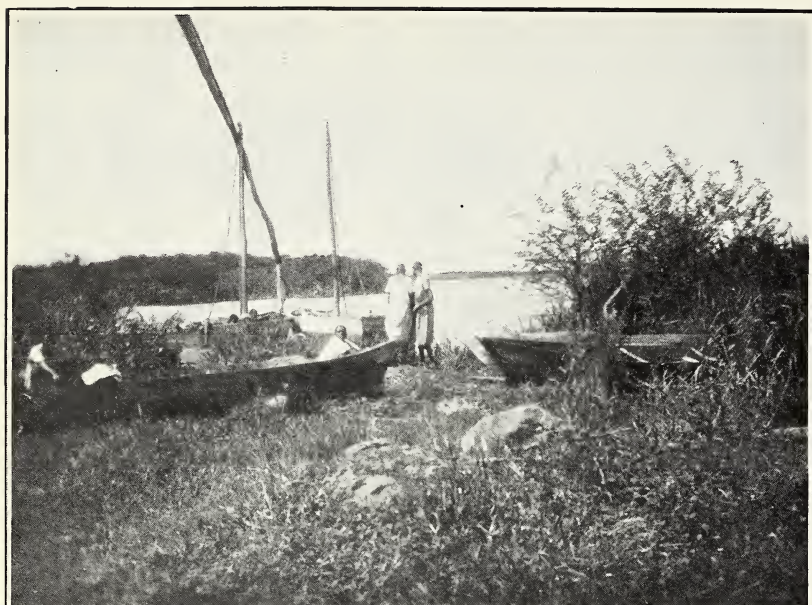
Further rules were published on 14/2/19 (Victoria Nyanza Fish Protection Rules, Govt. Notice No. 50, *Official Gazette*, page 103). These provided that any person other than a native—who is exempt from registration under other rules—who employs natives to catch fish, shall be liable to registration and to other provisions as if he were himself a person employed in catching fish, and any person buying or bartering fish for resale or barter either by wholesale or retail shall be registered as if he were employed in catching fish.

METHODS OF CAPTURE :

The fishing industry is in the hands of Indians who own the boats which are manned by natives. These natives in addition to their pay get a few of the fish caught. The vessels used are locally built flat bottomed boats 25 ft. long, 6 ft. beam and 2 ft. deep and cost about £50 each. They carry a lateen sail and the crew is generally five. They go out in the afternoon and lay the nets at sunset taking up the catch before daybreak and returning in the morning. Asembo Bay,



Drying Nets at Nanga Fishing Village, near Kisumu.
Fishing Fleet near Nanga Fishing Village, near Kisumu.



Canoes and Fishing Boat at Nanga Fishing Village, near Kisumu.

Nanga Fishing Fleet, near Kisumu.



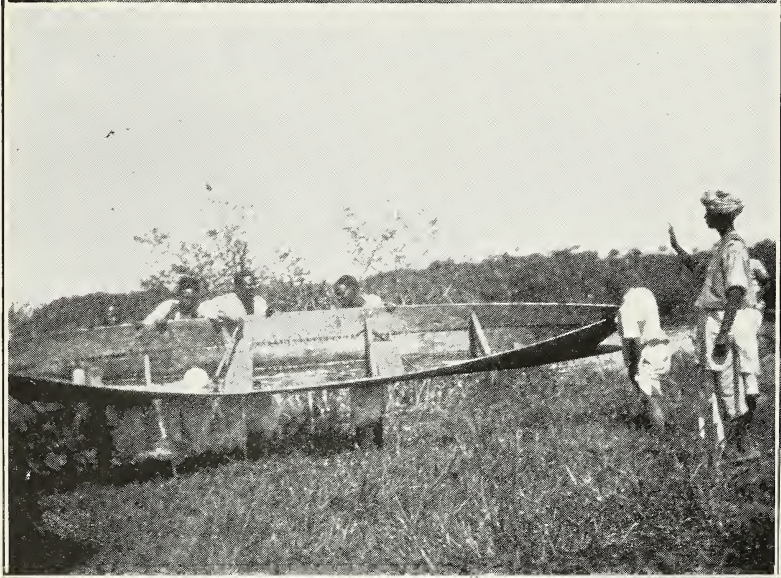
Two Rafts and one Fish Trap and Weir at mouth of Kibos River.

Fish Traps (Musathi) near mouth of Kibos River.



Fish Weir (Kew) at mouth of Kibos River.

Kavirondo raft near fish weir at mouth of Kibos River.



Fisherman in Canoe, Kach Bay, Kisumu.

Canoe on Lake Victoria.

Kadimu, and Karachonya are the best fishing grounds. Fewer fish are said to be caught during the full moon and the takes are greater when the nights are dark and rainy.

The boats put out 10 to 20 nets each, *i.e.*, 1,000 to 2,000 yards. During the building of the Eldoret Railway one European who supplied fish to the labourers manipulated up to 8,000 yards of nets.

The 5 to 5½ inch mesh takes the Ngege, Mbiru, Mumi, Kamongo, Seu, Suma, and sometimes Sira. Occasionally a net of a 3 inch mesh is used and this takes the Ningu, Sira, and Osoga.

These nets run on a coir rope top and bottom. The top is supported by corks and the bottom weighted with iron rings. They only catch fish while drifting and any check through catching on an obstruction will render them useless. The nets are often damaged by floating islands, boats, and crocodiles.

FISHING CENTRES:

There are three Indian fishing villages in the Gulf, at Seme, Asembo, and Nanga. The last is only three miles south of Kisumu and is the only one near enough to supply fish for the Nairobi market.

MARKETING AND COST:

The fish for the Nairobi market are brought in by natives in sacks on Sundays, Mondays, Tuesdays, and Thursdays. They are cleaned by Kavirondo women under a tree on the Lae shore near the station and are packed in ice and despatched to Nairobi by the 2-25 p.m. train. The Kavirondo women obtain the entrails as their perquisites and the Indian who superintends takes the gills which appear to be regarded as a delicacy and are extracted before the fish are packed. The fish are packed in ice in large chests. The ice costs 18 cents a pound and one pound is required for each fish. The freight to Nairobi is Shs 3/50 per 100 lbs. Together with the other incidental expenses it costs about 25 cents to send a fish to Nairobi. When the fish are plentiful the usual price is 25 cents a fish in Kisumu market.

ADVERSE TIMES FOR FISHING.

The months April to August are not good fishing months and during these months the natives entirely give up fishing in the Lake with drag nets and confine themselves almost entirely to catching fish in the river weirs (Kek).

SPAWNING:

Most of the Lake fish spawn in May, June and July. Carp (Ngege and Mbiru) are plentiful during the other nine months. The carp (Kavirondo Ngege) spawn in shallow water with sandy bottom at a depth of 3 to 5 ft., and are thus immune from capture by nets which cannot be used in such shallow spots. They do not spawn in the Gulf except in rare cases but choose the spawning

beds near the Islands where the bottom is sandy. The female scoops out a circular hole and deposits the eggs and the male then fertilises them and takes charge hanging over the nest and keeping away sediment by the action of the fins and tail till the young hatch out. This fanning motion keeps fresh water passing over the eggs.

It seems probable that the fish come up the Gulf to spawn and are then caught. A continuance of this year after year may be exterminating the Gulf fish. There is not any close season under the Ordinance. It is possible that the natives catch fry near to the shore under the impression that they are full-grown fish of a small type.

It will be noted that there is a certain amount of divergence of opinion as to where the fish spawn. My authority for stating that they do not spawn in the Gulf is Mr. Oorloff, ex-Government Assistant Surgeon, who is a local authority on Lake Victoria fish.

DECLINE OF INDUSTRY: DIMINISHING CATCHES.

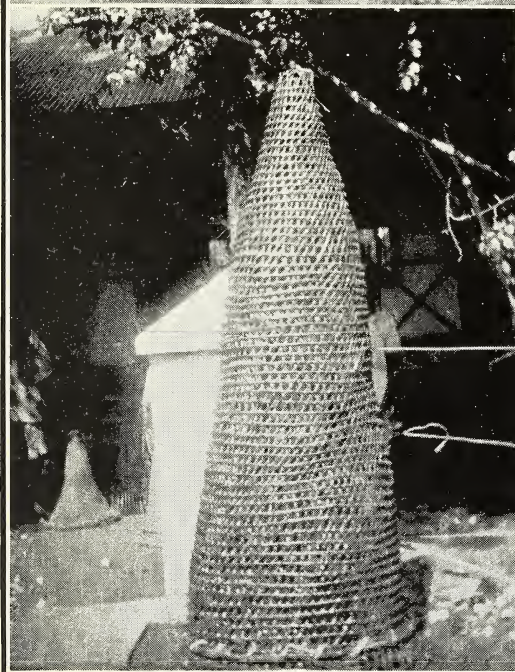
There appears to be no doubt whatever that fish taken in the Lake are decreasing and various reasons have been brought forward to account for this. Mr. Acton, Superintendent of Inland Revenue and Conservancy, dealt with this in his annual report report for 1923 and the figures he gave are of interest and worth quoting:

| Year. | Sum collected for licences. | | Average retail price of fish. | |
|---------------------|--------------------------------|----------------|----------------------------------|--|
| | Shs. | Cents. | | |
| 1917-18 | 16,350 | 60 | | |
| 1918-19 | 14,530 | 70 to Shs. 1/- | | |
| 1919-20 | 19,350 | 50 to 75 | | |
| 1920-21 | 19,200 | 50 | | |
| 1921 (9 months) ... | 16,300 | 40 to 25 | | |
| 1922 | 9,900 | 25 | | |
| 1923 | 8,120 | 25 | | |

The following are the corresponding figures for the subsequent years:

| | |
|---------------------|--------|
| 1924 | 8,700 |
| 1925 | 10,500 |
| 1926 | 8,250 |
| 1927 to 31/5/27 ... | 5,700 |

He states as follows: " During 1923 the fishermen appeared to have great difficulty in paying the annual licence of Shs. 300/- and although given a good deal of time in which to pay most of them had to be summoned to force payment.



BASKET TRAPS.

1. Angu, used by women.
2. Angu, used by men.

3. Musati.
4. Sienyu.

POSSIBLE REASONS FOR DECLINE:

The decline in the industry appears to be due to three main factors:—

- (a) Fewer fish in the Kavirondo Gulf than formerly.
- (b) Decline in retail prices giving less profit.
- (c) Poverty of the fishermen.

In regard to (c) it may be remarked that during the years of high retail prices many wealthy merchants, Goans and Europeans, were engaged in fishing. These have since withdrawn and the class now carrying on the work usually have to buy nets and boats on credit or pay heavy interest on borrowed money, destroying the fishers' small profit and causing more and more to abandon fishing."

It is generally admitted that the catches of fish are less than they were. In the early years the average catch is estimated to have been over 25 fish per 100 yards of net while the boats operated at only about a mile from shore. In later years the catch fell to 5 per net and to get these the boats have to go from 12 to 15 miles out. The number of boats has also fallen off. At the height of the industry's prosperity there were 150 boats working on an average 10 nets per boat. Some boats worked as much as 20 to 25 nets.

NATIVE METHODS OF CAPTURE: NETS.

Turning now to the methods employed by the ordinary natives living along the Lake shores we find that fish are caught by drag nets, weirs, traps, harpoons, long lines and to a very small extent with fishing rods. The drag nets used are made of papyrus stems fastened close together and are about 5 ft. deep. They are made in two sizes, the larger size being called by the Jaluos "Gogo" and the smaller "Ogoda." One end of the net is towed out by men in canoes some distance into the Lake and is taken round in a half circle so as to enclose a considerable area of water. The two ends are then drawn towards the shore so that the net brings in with it any fish that have been enclosed. When it is fairly close in men wade into the water with long baskets (Dholuo, Aunga) and capture the fish in these. These baskets are a form of trap made on much the same principle as a lobster pot and consist of a large cone of basket work about 6 ft. long with a smaller cone inside it pointing in the same direction. The inner cone is open at the end so that when a fish enters at the wide mouth of the basket it swims through the hole at the end of the inner cone and gets imprisoned in the space between the two cones.

BASKET TRAPS, PORTABLE AND STATIONARY.

A smaller form of Aunga is used by women, called Aunga Ketenga. There are two varieties of this, one with the double cone and one with only a single cone. When using the double cone ones they place three

or four in a line on the bottom. They then go some distance in front and frighten the fish into the traps. The single cone traps are used by the women in a different way. They hold the baskets in both hands with the wide part facing towards them and wade backwards in shallow water drawing the baskets along the bottom towards them. When the fish enter the basket they raise it out of the water in a perpendicular position. The following fish are caught by this means: Nyawino, Ndera, Ningu, and Akunga (eels). The Ningu is not caught in rivers during May, June and July as it goes to the Lake then presumably to spawn.

BASKET TRAPS USED AT WEIRS.

Enormous fish weirs (Dholuo, Kek) are a feature of the rivers of Kavirondo. Some of these are built of wood and some of stones and extend right across the rivers from bank to bank. At intervals in the weir there are gaps and basket traps (Dholuo, Musathi) are used on the upper side of these holes to catch the fish as they pass through up stream. The Musathi are similar in principle to the double coned Aunga, but are made of reeds fastened together longitudinally, while all types of Aunga are plaited.

PORTABLE TRAPS.

Another form of basket fish trap is the Sienyu. This is also a conical basket with a hole at the top or narrow end. The native using it wades along in shallow water pushing it down at intervals on to the bottom of the lake or river. If a fish happens to be imprisoned it is heard splashing inside and the native puts his arm through the top hole and pulls it out. The Sienyu is also made of reeds fastened together longitudinally.

STATIONARY TRAPS, BAITED.

In addition to the foregoing there is another kind of basket trap used called Omuongo, which is almost identical with a European lobster pot and used with bait and in the same way.

FISHING SPEARS.

Fish are sometimes harpooned by natives wading in the water. The harpoon used is narrow and has no barb and is called by the Jaluo Bedthi. Mumi and Kamongo are speared in this way.

The natives of Mohuru are said to go out in canoes on moonlight nights with grass torches and harpoon the fish.

FISHING WITH ROD AND LINES.

Fishing with rod and line is indulged in principally as an amusement and by juveniles. Long rods made from a tree called Poo are used by men. Hooks (Dholuo, Oloo) are bought in the bazaar. The bait used is a sort of worm (Dholuo, Oniambo) found in the mud. Mumi (barbel) are caught in this way. The line is made from

papyrus fibre. Small rods made from a tree called Osire are used by children. A dried piece of mtama stalk is used as a float. Nyawino, Nthira, Osoga, and Sire are caught in this way. The bait used is Oniambo or a piece of groundnut. Long lines, Mugondo, with a large number of hooks are sometimes used. These are left in the water for some time with floats at intervals to buoy them up.

FISH USED FOR LOCAL CONSUMPTION.

As most of the fish caught by natives is not eaten fresh, but dried, the whole of the population of these locations could easily eat fish caught on the Lake shore. In fact there is no doubt that dried fish is transported and eaten by the natives very much further inland than these Lake shore locations. The whole Jalu population of Central and South Kavirondo will eat fish if they can get it. The population is approximately as follows:—

| | |
|------------------------------|---------|
| Central Kavirondo | 316,000 |
| South Kavirondo (Luo) | 180,387 |

The two Districts which border on the Lake shores in Nyanza Province are Central and South Kavirondo. The natives living close to the shore in both these Districts spend a large part of their time fishing. It has been estimated that about two to three thousand in each District are more or less permanently employed in this work. They use canoes (Dholuo, Yiyi) made of rough boards sewn together with grass fibre and caulked with mud. There are probably about 1,000 canoes in each District (Central and South Kavirondo). They are propelled with single bladed paddles (Ngai).

The following are the names and population of the Locations in these two Districts which actually border on the Lake shore from the Sio River on the Uganda border on the North of the Gulf to Mohuru on the Tanganyika border on the South side:—

| CENTRAL KAVIRONDO. | | | | | Population. |
|--------------------|-----|-----|-----|-----|-------------|
| Name of Location. | | | | | |
| Samia | ... | ... | ... | ... | 33,000 |
| Kadimu | ... | ... | ... | ... | 6,000 |
| Sakwa | ... | ... | ... | ... | 13,000 |
| Uyoma | ... | ... | ... | ... | 10,000 |
| Asembo | ... | ... | ... | ... | 18,000 |
| Seme | ... | ... | ... | ... | 26,000 |
| Kisumu | ... | ... | ... | ... | 15,000 |
| West Kano | ... | ... | ... | ... | 19,000 |
| Nyakach | ... | ... | ... | ... | 22,000 |
| | | | | | <hr/> |
| | | | | | 162,000 |
| | | | | | <hr/> |

SOUTH KAVIRONDO.

| | | | | |
|--------------------|-----|-----|-----|--------|
| Karachonya | ... | ... | ... | 21,105 |
| Kochia | ... | ... | ... | 7,327 |
| Kaniada | ... | ... | ... | 9,579 |
| Kasigunga | ... | ... | ... | 2,442 |
| Kaksingiri | ... | ... | ... | 1,463 |
| Gwasi | ... | ... | ... | 5,390 |
| Karungu | ... | ... | ... | 2,569 |
| Kadem | ... | ... | ... | 11,145 |
| Mohuru | ... | ... | ... | 771 |
| Rusinga (Island) | ... | ... | ... | 2,099 |
| Mfwangano (Island) | ... | ... | ... | 1,792 |
| | | | | 65,682 |

BRIEF ACCOUNT OF VISIT TO KACH BAY.

The following short account of a trip round Kach Bay and up the Miriu river may be of interest as showing different methods of fishing followed by the Lake shore Jaluo. I had arranged with the son of Chief Amimo of Kanu to go and see the fish being taken out of the basket traps at the weirs at the mouth of the Kibos river and at 6-30 a.m. on May the 29th started off from the Dhow Pier with B. in the Government Motor Boat. It took us about one hour to get to the mouth of the river and on the way we saw the fishing fleet coming back with the night's catch to Nanga fishing station. We ran the motor boat a few yards up the river mouth and landed and the boy lit a fire and prepared breakfast. While waiting we watched the various fish-eating birds which were very numerous. The ordinary Darter *Anhinja rufa* (Dholuo, Osoo) was there in large numbers. This bird goes right down under the water after the fish. It is said to capture the Fulu, Adel, and Osoga. An occasional cormorant (Dholui, Kwasi) was to be seen and one or two storks (Dholuo, Okol) while numerous birds like seagulls and teons (Dholuo, Sialo) were flying about and occasionally dipping down into the water to capture a small fish.

The most remarkable birds however were the pelicans, *Pelicanus onocrotalus* (Dholuo, Mbuzi) which were floating quietly about and occasionally dipping their enormous beaks into the water and then raising them skyward to allow the unfortunate victim to slip down their throat more easily. Large numbers of kingfishers, *Ceryle rudis* and *Corythornis cristatus* (Dholuo, Kalamendi) were also seen. The empty shells of numerous fresh water snails (Dholuo, Ogongolo) strewed the shore, which was very sandy. While we were waiting a native brought up a small fish trap (Dholuo, Musathi) which he had just taken out of a ditch running into the Lake. This contained five

small fish: two Adel about four inches long, two Sire and one Ningu. We were also shown two small eels (Akunga). When breakfast was finished we walked up to see the big weir across the river. It was about 50 yards from the mouth and stretched from bank to bank in a zig-zag line. It was made of rough poles driven into the sandy bottom of the river which was very sluggish at this point. Numerous gaps had been left in the barrier and above every gap facing down stream was fastened a fish trap (Musathi) of which there were about 30 or 40 in all. By this time numerous natives had collected together and several rafts had been brought down to assist in lifting up the traps. These rafts were of several kinds. One kind consisted of long thin poles of very light ambatch (Dhofo, Mhuri) wood fastened together. This wood, when dry, is as light as cork and is used for floats for the Mugondo, or stationary lines, and also by the Mohuru natives for floating their hippopotami harpoons. The second raft was a large square frame about 12 ft. by 5 ft. made of poles fastened together three deep by iron rods. The floor appeared to be made of some sort of matting. This raft, as it appeared to be the safest, we chose to stand on while watching the fish traps being taken up. The raft was tied up to the top side of the weir while two natives went into the water which was up to their shoulders and unfastened the traps one by one. When they were undone the native who was with us on the raft pulled the trap out of the water with the mouth up and the fish that were inside slipped to the end of the cone. When he got it on the raft he turned it the other way up and the fish could then be pulled out where the inner basket was fastened to the outer one at the mouth. The fish were then put into a receptacle of matting work for safe keeping called Ngaha. We watched 20 of these baskets being taken out and the following is a record of the catch in each basket. I was informed that these catches were very very small compared with what is usually taken in the months when fish are plentiful.

It is noteworthy that only one of the 20 baskets drew a complete blank and in one other both the fish Ngege were dead.

| | | | |
|-----------------|---------|------------------|---------|
| 1st trap | 1 Mumi | 11th trap | 5 Ngege |
| 2nd ,, | 2 Ngege | 12th ,, | 1 Ngege |
| 3rd ,, | 1 Ngege | 13th ,, | 9 Ngege |
| 4th ,, | 1 Ngege | 14th ,, | 3 Ngege |
| 5th ,, | 1 Ngege | 15th ,, | 1 Ngege |
| 6th ,, | 1 Mbiru | 16th ,, | 3 Ngege |
| | 1 Ningu | 17th ,, | Empty |
| 7th ,, | 1 Ngege | 18th ,, | 2 Ngege |
| 8th ,, | 1 Sire | | 1 Mbiru |
| | 3 Ngege | 19th ,, | 1 Ngege |
| 9th ,, | 1 Ngege | 20th ,, | 1 Ngege |
| 10th ,, | 2 Ngege | | |

The total catch of the 20 traps was therefore 38 Ngege, 1 Mumi, 2 Mbiru, 1 Ningi, and 1 Sire, *i.e.*, 43 fish in all.

We left the Kibos river at 9-30 and went on towards the end of Kach Bay seeing numerous fish eating birds on the way.

LINE WITH MULTIPLE HOOKS.

There were also quite a number of natives in canoes and one of these to whom we spoke was working a long line called by the Jalu Mugondo. This is a very long line weighted at one end with a stone. At intervals along it are hooks fastened to the main line by short lengths of thinner line and baited with pieces of fish mostly Fulu. It is also buoyed at intervals by floats of ambatch (Mburi) wood. The native in the canoe holds the other end. The hooks of some of these lines we saw were the ordinary barbed variety bought in the shops but one man had barbless hooks evidently locally made.

They were very sharp and curved almost into a complete circle, while the point was slightly bent to one side. I tried to buy this line from the owner but he refused to part with it.

WEIRS AND TRAPS, NOT IN RIVERS.

Along the shore and end of Kach Bay, near the mouth of the Nyando river, we saw two other varieties of fish weirs called by the Jalu Osageru and Bwanza, something on the principle of the river weir (Kek).

The Osageru resembles a maze and is made of papyrus stalks (Dholuo, Togo) driven into the bottom of the Lake and fastened together and forming a barrier through which the fish cannot pass. As far as I can discover the fish in the course of their peregrinations meet this barrier and move along it until they get caught in a suitably placed basket trap (Musathi). The Osageru is as often as not entirely below the surface of the water and just outside the mouth of the Miriu River we came across a canoe and a raft containing two and one man respectively engaged in building this form of trap. We were informed that a fourth man was working on the Lake bottom pushing in the papyrus stalks. He eventually came up for air and it was amazing the amount of time he spent underneath.

TRAPS AND ARTIFICIAL RUNS.

The Bwanza is also made of papyrus stalks. It is a small barrier built across little channels cut into the papyrus swamps or scooped out of the sandy shore either on the side of the Lake or on the river bank.

A small gap is left in the barrier, and basket traps are placed on the side away from the Lake or river as the case may be. The fish

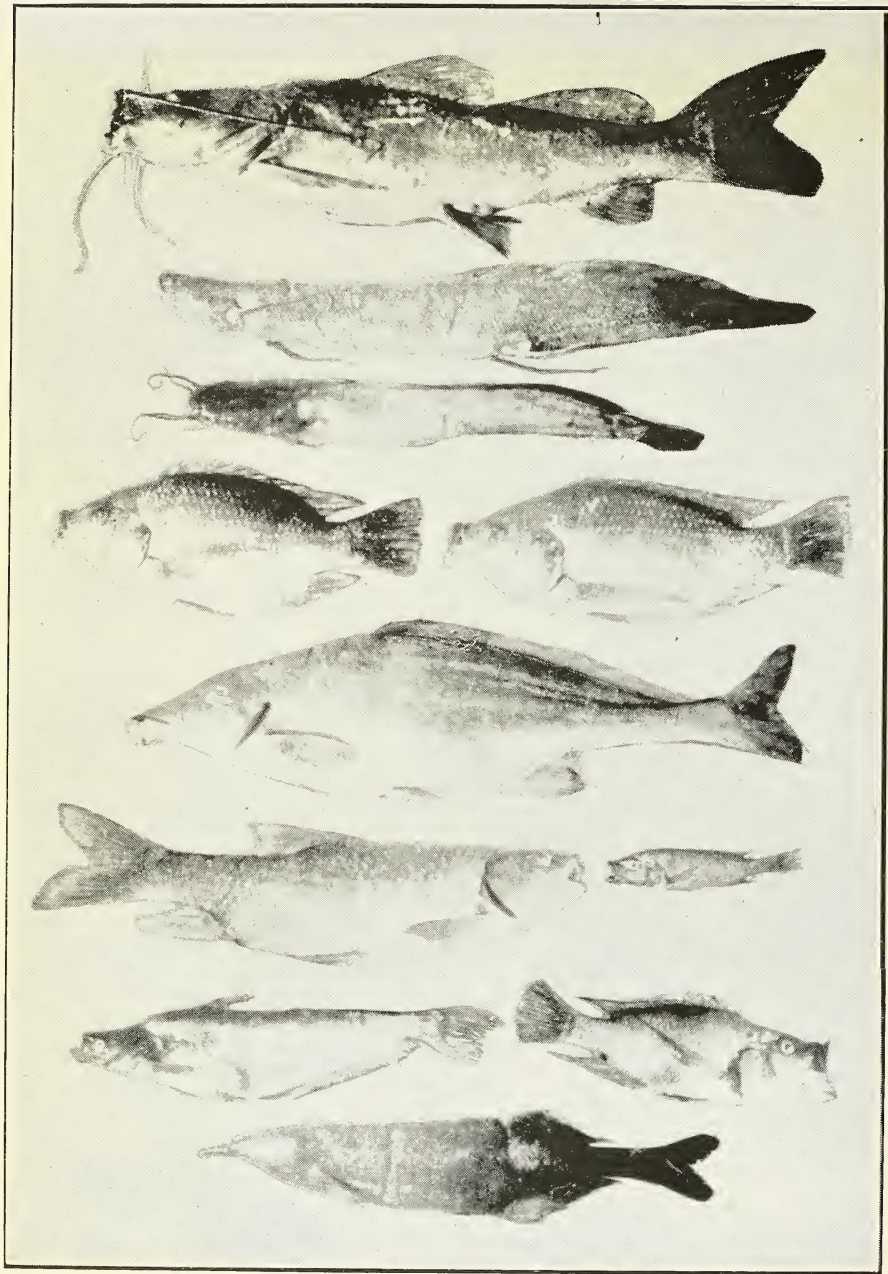


Photo by C. M. Dobbs.

FISH FROM KAVIRONDO GULF.

1. Seu (*Bagrus docmac*).
2. Kamongo (*Protopterus athiopicus*).
3. Mumi (*Clarias mosambiacus*).
4. Ngege (*Tilapia sp.*) 5. Mbiru (*Tilapia variabilis*).
6. Suma (*Mormyrus sp.*).
7. Fwani (*Barbus radcliffei*) 8. Fulu (*Haplochromis sp.*).
9. Sire (*Schilbe sp.*) 10. Osondogoro (*Haplochromis sp.*).
11. Ondhuri (*Gnathonemus longibirbis*).

trying to work their way into these channels get caught in the traps. On leaving the end of Kach Bay we made for the mouth of the Miriu river. On the way we were much interested in the performances of a kingfisher (*Ceryle rudis*) which flew for some time parallel to the boat and a considerable height above the water. At intervals it would spot a fish, poise itself for a second or two, then drop like a stone perpendicularly into the Lake beak first with a splash, to rise again almost immediately and continue its flight. The Miriu is known higher up as the Kipsonoi and Sondo, but is called the Miriu when it passes through the gorge in the escarpment and comes out into the Lake plain. From there it runs through the level country at first between high solid banks, but as it nears the Lake these disappear and are succeeded by dense papyrus swamps. The channel is exceedingly tortuous, in some cases nearly doubling back on itself, and the total distance from the gorge to the Lake is about seven miles. We took the boat about five or six miles up till we grounded on a sandy spot after which we returned down stream. Several crocodiles (Dholuo, Nuang) were sighted on the way up and one varanus (Kalaguena) which is said to eat fish. When we started to float down with the engine running very quietly, we saw more crocodiles lying out on the mud banks, especially on the higher reaches of the river.

These reptiles must destroy vast quantities of fish and as very few of them are shot they are presumably increasing. It took about an hour to get back to the mouth of the river and two hours from there to Kisumu. I saw no otters (Dholuo, Mandoholo) on this trip. Some years ago I saw two swimming in the Miriu river.

The following are the names of the various fish found in the Lake, with a brief description of each of those I have seen. The list has no claim to be exhaustive.

- (1) SUMA. A big fish with a nose and mouth like a trunk. Inhabits the Lake. It is not very popular as food. It is rarely taken in nets or on hooks. A few are taken in traps. Scales very small. Has firm flesh. The natives think that they get itch from eating it. —*Mormyrus sp.*
- (2) NGEGE. A carp-like fish. Firm flesh which lasts well. This is the principal food fish of the Kavirondo Gulf and is sent to Nairobi in considerable quantities. It is extremely like the Mbiru. —*Tilapia sp.*
- (3) MBIRU. A good eating fish and very difficult to distinguish from the Ngege. The only difference appears to be that it is a bit darker and the tops of the spine are reddish. It does not keep fresh so long. A small variety of this fish, possibly its fry, is called Obudi. —*Tilapia variabilis.*

- (4) KAMONGO (Swahili, Mamba). This is the Lung fish *Propterus aethiopicus*. It is a mud fish and can live out of water in mud for months. The natives are fond of this fish. It breeds in papyrus swamp. When caught it utters a grunting sound. It is not eaten by Mohammedans. Lives in Lake and rivers.
- (5) FULU. A small fish. Lives in Lake and rivers.
—*Haplochromis* sp.?
- (6) SEU. A spined barbel. Has a big mouth with whiskers. Eats other fish. Grows very large. Takes meat or fish bait. Not very popular as food. Caught in the Lake. Not a very important fish. Only a few caught. —*Bagrus docmac*.
- (7) FWANI. A yellow fish with big scales found often in rivers. Known as the Kisinja. This is the fish caught at the Jinja Falls. A true Barbus. Inhabits the Lake and large rivers. Very bony and poor food. —*Barbus Radcliffi*.
- (8) ONDHURI. Found in Lake and rivers. Has a curious fleshy proboscis on the lower jaw. —*Gnathonemus longibirbis*.
- (9) OKOKO. No scales. Spotted. Upright fin on back. About 9-12 inches. Found in Lake and rivers. Edible.
- (10) MUMI. The barbel of South Africa. Called in Swahili Kambare. Has a very flat head and grows very large. Eaten only by Africans. Eats other fish. Of no commercial importance. A mud fish. Will take bait.
—*Clarias mosambiacus*.
- (11) NINGU. Has scales and is very bony. Only eaten by natives. Caught in the Lake. The mouth is underneath.
- (12) SIRE. Found in Lake and rivers. Edible. Has two deep depressions on each side and a hump on top. Has a shovel mouth. Something like a herring. Probably *Schilbe mystus*. Known also as the Butter fish. Breeds in the papyrus. Seldom caught in nets. Generally in fish traps. Said to be quite the best eating fish of Kavirondo waters, but not caught in commercial quantities and probably would not travel well. In season takes bait. When cured and smoked not unlike dried red herring. —*Schilbe*.
- (13) OSONDOGORO. A scaly fish like a John Dory. Found in the Lake. Edible. —*Haplochromis* sp.?
- (14) OSOGA. A small silvery fish. Caught along the Lake shore with rod and line. Edible. —*Alestes nurse*
- (15) NTHIRA. Said to be the young of the Mumi. Very like the Nyawino but lighter.

- (16) NYAWINO. Like the Nthira but does not grow big and is of a darker colour. Inhabits the Lake and rivers. Edible.
- (17) NDERA. Small fish found in the rivers.
- (18) OMENA. A very small silvery fish caught in traps in the Lake. —*Engrauli cypris*.
- (19) OYORA. Said to be the young of the Ngege.
- (20) OBUDI. Said to be the young of the Mbiru.
- (21) ADEL. A small scaled fish of silvery colour about four inches long.

There are other fish which I have not been able to see and cannot describe, but they are said to live in the Lake and rivers and to be edible. The names given are: Otenda, Adendi, Otengo, Nyangoro, Obu.

I have also seen small eels (Okunga), about a foot long, caught in the Lake. Crabs (Okela) and Oysters, and fresh water tortoise (Opuk) are also found.

For a good deal of the material embodied in this article I am indebted to reports made some years ago by Dr. Orloff and Mr. Blaney Percival and also for figures and information supplied by the Administrative Officers in Central and South Kavirondo and the Superintendent of Inland Revenue and Conservancy. The native names given are Dholuo (*i.e.*, the language spoken by the Jalu Kavirondo except where otherwise stated.

SAHI LAKE, MERU DISTRICT.

By C. M. DOBBS.

This lake is sacred in the eyes of the local natives. The track leads through thick forest, and the going is very slow. It is a crater lake, entirely surrounded by thick forest, and without any outlet, except possibly subterranean. The only people who know the way there are certain old Wanderobo, and they have to carry a supply of honey and wimbi grain before they will make the venture. We started with them at about 7-30 a.m., and walked through thick forest for about an hour, till we struck a large elephant track, which led us easily in 15 minutes to the lake. Several times during the walk our guides stopped, chewed up honey and wimbi, and spat it out towards the four corners of the compass, muttering prayers the while. I was informed that they were praying for strength to continue the journey.

When we struck the main elephant track at about 8-30, all the natives with me sat down, while the old Ndorobo went through some ceremonies. When we reached the shore of the lake, they had to go through the same ritual before they went near the water. The lake is about a mile in diameter, almost circular. There appears to be no outlet on the surface. There is a good deal of clear water, and I saw none of the blue water-lily that covers almost the whole of Gunga Lake, which is another crater lake, close to Meru, on the Nyeri road. There were many duck on the lake, but my Ndorobo guide would not hear of my shooting any; apparently, they are regarded as the property of the local Shaitan.

The legend about the sacred Lake of Sahi is that an old man of Katheri, called Nkuchuchu, shot a buck close to the Lake and was accused by the resident Spirit of killing his goat. He was punished by having all his hair taken off, and it never grew again.

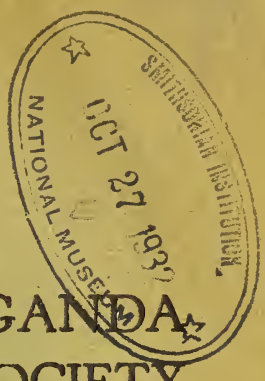
On another occasion, I visited Gunga Lake, and heard a curious noise, evidently emanating from the lake. I asked the boy who was with me, what the noise was. He immediately replied: "It is the Shaitan of the Lake."

All the crater lakes are said to be inhabited by spirits of sorts, and the natives are very afraid of them.

USE FOR ANTS' NESTS.

There are numerous ants' nests in the trees and bushes in the Meru District. They look something like wasps' nests at home, and are made of cow-dung and mud. The Meru call the ants "Mpampo"; they are small and black. The natives use them as a charm to keep off the evil eye. Nearly every village has an ants' nest at its front gate, stuck up on a stick.

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The Journal OF THE EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

October, 1927 & January, 1928.

No. 31 & 32.

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EDITOR OF JOURNAL:
Dr. V. G. L. van Someren.

Additional copies to members, Shs. 7/50; to non-members, Shs. 15/-.

(Date of publication, June, 1928.)

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The Journal

OF THE

EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

October, 1927 & January, 1928.

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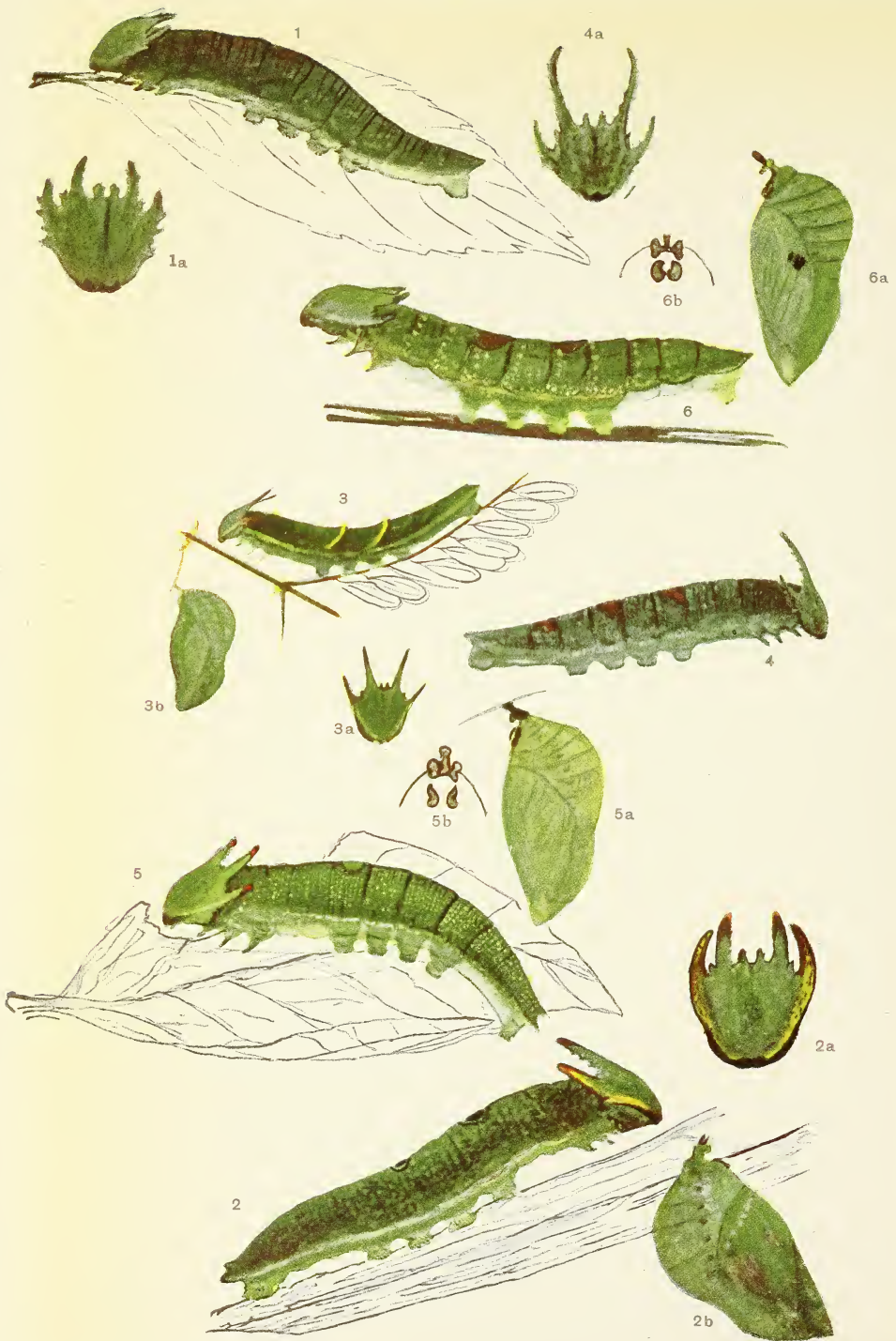
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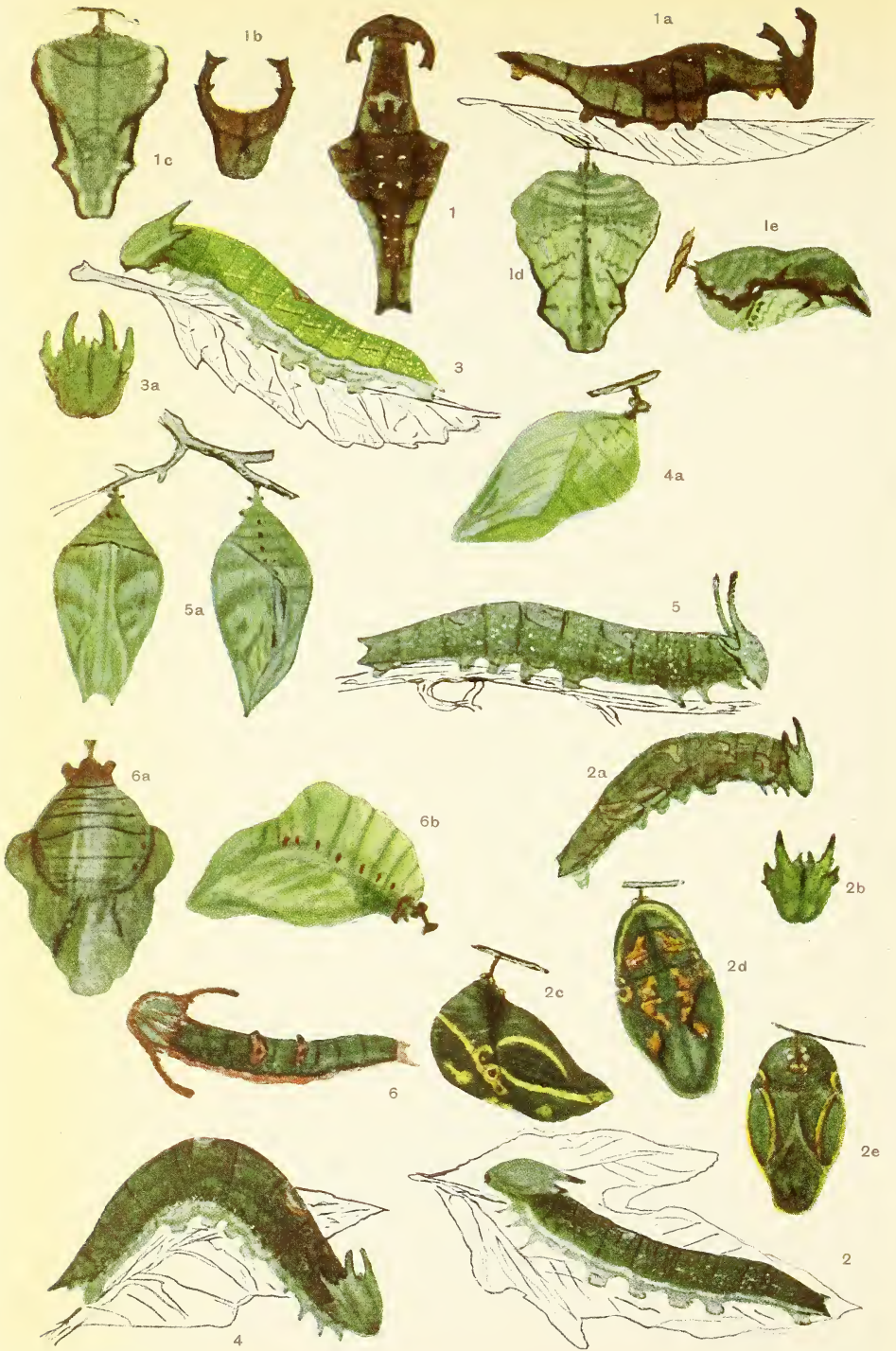
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LARVAE AND PUPAE OF CHARAXES.
All the figures are of the natural size.



V. G. L. van Someren, pinx.

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LARVAE AND PUPAE OF CHARAXES, EUXANTHE AND PALLA.

All the figures except 1 and 1a (slightly reduced) are of the natural size.

PLATE XLVII.

Larvæ and pupæ of *Charaxes*.

- Fig. 1. *Charaxes brutus brutus*: 1, larva; 1a, head (Jinja).
2. „ *castor castor*: 2, larva; 2a, head; 2b, pupa (Jinja).
3. „ *baumanni*: 3, larva; 3a, head; 3b, pupa (Nairobi).
4. „ *varanes vologeses*: 4, larva; 4a, head (Jinja).
5. „ *jasius epijasius*: 5, larva; 5a, pupa; 5b, anal extremity (Jinja).
6. „ *numenes numenes*: 6, larva; 6a, pupa; 6b, anal extremity (Jinja).

PLATE XLVIII.

Larvæ and pupæ of *Charaxes*, *Palla*, and *Euxanthe*.

- Fig. 1. *Palla ussheri interposita*: 1 and 1a, larva; 1b, head; 1c, 1d and 1e, pupa (Jinja).
2. „ *etesipe etesipe*: 2, larva; 2a, larva, just before pupating; 2b, head; 2c, 2d and 2e, pupa (Jinja).
3. *Charaxes pollux pollux*: 3, larva; 3a, head (Nairobi).
4. „ *citharon*: 4, larva; 4a, pupa (Nairobi).
5. „ *fulvescens monitor*: 5, larva; 5a, pupæ (Jinja).
N.B.—In figure 5 the dorsal spots should be on segments 6, 8 and 10, and not as depicted.
6. *Euxanthe ansellica*: 6, larva, immature; 6a, 6b, pupa (Jinja).

THE BUTTERFLIES OF KENYA AND UGANDA.

PART VII.

BY

V. G. L. VAN SOMEREN, F.E.S., F.L.S., etc.,

and

Rev. K. ST. A. ROGERS, M.A.; F.E.S.

SUB-FAMILY NYMPHALINÆ, (CONTD.)

CHARAXIDI.

INTRODUCTION:

The *Charaxidi* include some of the finest species in the country and are for the most part confined to woodlands and forests. There are three genera usually recognised, *i.e.*, *Charaxes*, which includes a very large number of species and extends into the Oriental region with one species in the southern part of the Palaearctic region; *Euxanthe*. and *Palla*, which are endemic.

(1) The species of *Charaxes* are generally large or medium sized butterflies and most of the species have an extremely powerful flight. They are much more numerous in West Africa than in East Africa and many species are confined to forests though a good number are found in woodlands even in dry districts.

They are addicted to settling on strong-smelling substances such as the droppings of animals particularly carnivora, but as a rule these are exclusively males; also on damp places near streams. They are also attracted by gummy exudations on a number of trees, and in this case both sexes are attracted.

They frequently settle on the bark of trees and also are very fond of basking in the sun, taking short rapid flights at frequent intervals. In cold districts they will even settle on the corrugated iron roofs of houses and are so bold that they may sometimes be captured by hand in such positions. Many of the species have geographical races, the East African forms being readily separable from the Western types. Very few species have seasonal forms though *Ch. zoolina* is a remarkable exception. The dry form of this species was for many years regarded as a distinct species under the name of *Ch. neanthes*. In Tanganyika where there is one long dry season the *zoolina* form is almost entirely replaced by the *neanthes* form at the beginning of the dry season, but this is not the case to the same extent in Kenya.

A very remarkable species is *Ch. ethocles* which has a large number of female forms which resemble both sexes of larger and more powerful species of the same genus.

(2) The species of this genus have already been dealt with. Their flight is less powerful than those of *Charaxes*, but they are also very fond of settling on the trunks and branches of trees generally

head downwards. They are confined to the Ethiopian region and are not numerous in species (one is found in Madagascar). They are broad-winged insects with a rather sluggish flight and are mainly forest insects, though *E. wakefieldi* is found in open woodlands and is more abundant than most of the other species. They do not seem to be attracted by strong-smelling substances to any great extent. The males are met with far more frequently than the females, which is also the case with most of the species of *Charaxes*.

(3) The insects in the Genus *Palla* are entirely confined to forests. They are very like *Charaxes* but less robust. The genus is represented in Uganda by one species—a race of a West African insect.

We are indebted to the Entomological Society of London for permission to use the plates illustrating larvæ and eggs; and to Professor Poulton for presenting them to the Society.

GENUS *CHARAXES*.

HADRODONTIÆ. Costal margin of fore-wing coarsely serrate.

GROUP I. *VARANES, FULVESCENS*.

The species of *Charaxes* included in this group are characterised by the curious greenish veins, with vein 3 and 4 of the hind-wing not stalked. Vein 4 of the hind wing is produced to form a long rounded spatulate "tail," but between this and the anal angle the outline is almost straight though occasionally there is a slight indication of a tail at vein 2, but very rudimentary. The underside of the wings is curiously like a dead leaf, and is ornamented with "eye spots." The sexes are similar. The larvæ and pupæ conform to a common pattern which is however constantly modified in the species and races. The larvæ feed on a group of plants which is common to all.

CHARAXES VARANES VOLOGESES, Mab. Pl. XLIX., figs. 1-3.

Expanse: Male 85-92 mm. Female 90-100 mm. General colour orange-brown with white areas at bases of fore and hind wings. Sexes very alike.

F.-w.: Basal area of fore wing bluish-white, extending to the middle of the cell, the base of area 2, the basal half of 1b and the basal half of 1a. Beyond this is a triangular area of orange, the base of which occupies the mid-area of the costa, the apex reaching the mid-point of 1a; beyond this the wing is reddish-orange-brown, ornamented with two rows of intercellular orange spots; the sub-marginal row extending from area 1b to 7, following the contour of the wing; the inner row less regular, the spots in 4 and 5 being set out slightly from the rest. The two rows are joined by indistinct dark reddish-brown spots. This area is decorated with wavy red-brown sub-basal transverse lines in 2, 3, 4, 5, and 6. The costa is ochreous-white at the basal half shading to orange brown distally.

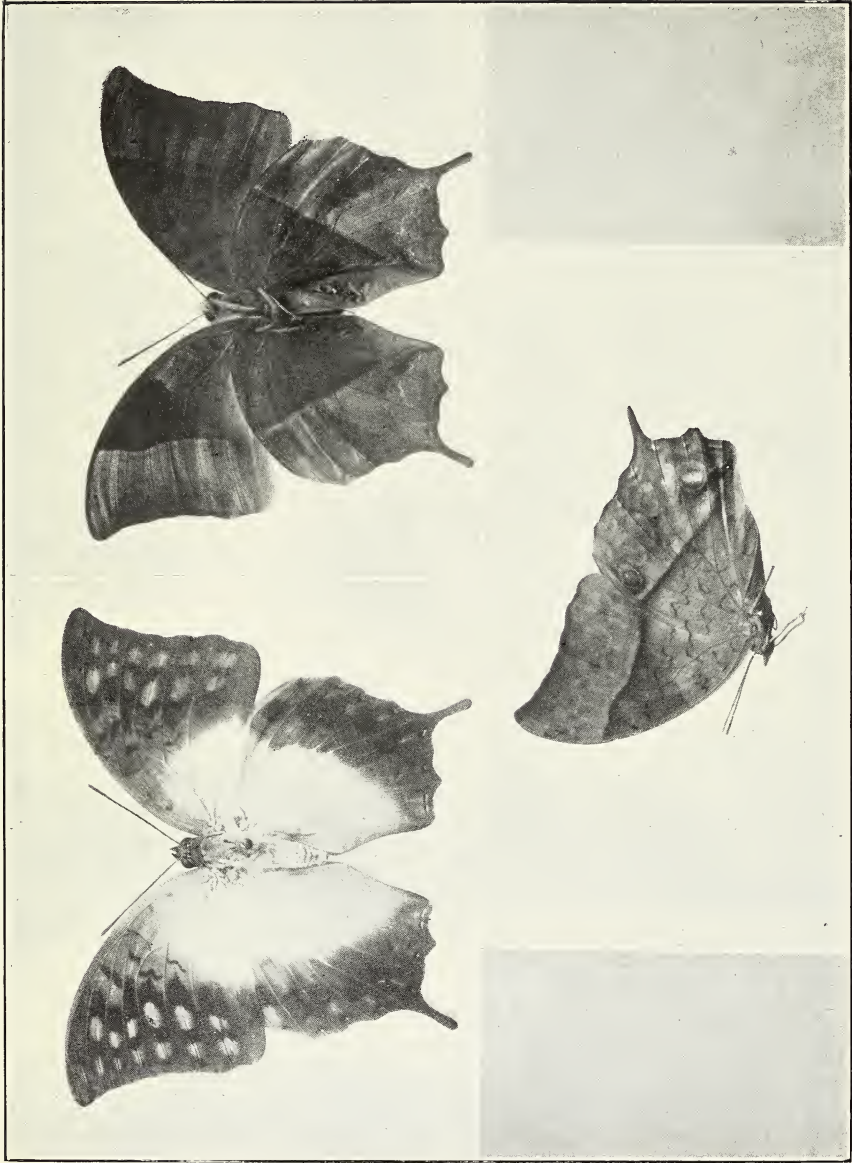


Photo: Dr. van Someren.

PLATE XLIX.

Charaxes varanes vologeses.

Fig 1, ♂ upper-side. Fig 2, ♂ underside. Fig 3, ♂ underside.

H.-w. Basal area from mid point of costa to anal angle bluish-white; distal half of wing orange-red-brown with an indistinct row of darker brown internervular circular spots from 2-6. The anal angle is almost rectangular, while vein two is obtusely angled, and vein 4 is extended into a long somewhat spatulate tail. The sub-marginal internervular areas of 1c to 7 are ornamented with crescentic blackish lines outlined distally with whitish. The thorax and abdomen are white above.

Underside: Pl. XLIX., figs 2 & 3. This varies considerably from a rusty brown to a greyish-russet; the general appearance is somewhat "dead-leaf-like," either almost uniform or with "eye spots" mostly on the hind wing, but both forms have a transverse dark line outlined distally with grey crossing both wings. The basal areas of both wings are decorated with a series of broken wavy blackish lines running transverse to the cellule. The basal halves of the fore and hind wings are dull, whereas the distal have a curious sheen which accentuates the dividing line.

EARLY STAGES: Pl. LXXII., fig. I., Pl. LXXIV., fig. 6.

Charaxes varanes lays its eggs on three species of *Allophyllus* (*Sapindaceæ*)—*macrobotrys*, Gilg., a species near *subcoriaceus*, Bak., and an undetermined food-plant known to the Baganda as "Nkuzanyana". Of these small trees, which are commonly found in the forests round Nairobi, the first two are also the food-plants of *Ch. fulvescens* and the last that of *Ch.f.nr. acuminatus*.

At the coast *varanes* oviposits on a creeper (probably belonging to this same family) which abounds on the coral cliffs of Mombasa Island.

The eggs are white or yellowish when first deposited, but turn quite brown just before the larva emerges. The top is flat and slightly fluted. There is no apparent difference between the egg of this species and that of *fulvescens*.

The newly-emerged larva is dirty yellowish in colour and has a pair of long whitish tails and a black head with short white-tipped horns. These horns are mere tubercles when the larva has just emerged but they are gradually extruded within the first twelve hours.

The first meal is made off the egg-shell and green food is not touched until the evening of the day on which the larva hatches.

The head in the first two instars is blackish or brownish, but in the third instar when the body becomes green, the head also takes on this colour. The body-spots appear at this stage.

The mature larva, Pl. LXXIV., fig. 6. Pl. XLVII., fig. 4. 4a. is dull olive-green or grey-green, heavily papillated with white-tipped tubercles, so that the whole surface has a finely speckled appearance. The dorsal spots are present on the sixth, eighth and tenth segments. In shape they are like those of *fulvescens*, and in colour they may be either greyish or brick-red. Sometimes only two spots are present.

The head, Pl. LXXVI., figs. 2 & 6. Pl. XLVII., fig. 4a., of the larva is characteristic, and it is noteworthy that the Nairobi and Coast form of *varanes* is in this respect quite distinct from the Uganda race. The chief points of difference are: (1) the horns of the eastern form are more slender and uniformly green in colour; (2) the lateral pair, seen from the front, form a nearly straight line with the lower half of the face, the corresponding contour being distinctly concave in the north-western form; (3) the central pair are first directed up, back, outwards and then inwards, while those of the Uganda insect project up, forwards outwards and then slightly forwards at the tips. Further the tips and the bases of the north-western form are blackish. There is therefore a marked difference between the head of the Nairobi *varanes* and that of *fulvescens* in Uganda, whereas, as we state later, we cannot separate the larvæ of the two species as they occur in Uganda. Cf. Pl. LXXVI., figs. 2, 5, 6, 14-17. The head is dull green with a greyish outline.

The pupa is a pale bluish-green, somewhat wedge-shaped both from in front and lateral view-points; with bluish-white streaks and spots, especially on the wing-cases and dorsum of the thorax. The abdominal segments are narrow and taper abruptly to the cremaster.

The head is bifid and forms an almost straight line with the wing-shields in front, and with the line of the thorax on the dorsum. The spiracles are indicated by blackish or brown spots.

DISTRIBUTION AND HABITS: *Varanes* is found in suitable localities from the coastal districts of Kenya inland to as far north as Marsabit, extending west through Elgon and into Uganda. The type of country frequented is the more open forests and "park land" and the less densely fringed river courses. They have a distinct liking for the vicinity of Acacias and Albizzias and indeed obtain a great deal of nourishment from the exudates from wounds in these trees. The flight, in comparison with other species of charaxes, is somewhat weak; one sometimes sees these insects flying in open sunny places but more often they keep fairly low, apparently preferring to settle on low scrub rather than high trees. Females are mostly taken round about the food plants of the larvæ, while males are taken at bait or when feeding on tree juices. At the Coast, one frequently takes them while feeding on the stalks of growing Maize or Mtama,

usually in association with Cetoniid Beetles, and ants. If a powerful species such as *cithaeron* happens to come to a trickle of sap where *varanes* is feeding, the latter invariably gives way to its more virile opponent.

The species is on the whole remarkably constant in colouration; the most pronounced variation is one in which there is no white at the base of the fore-wing, the basal half of the wing being a pale orange yellow. Examples from the Coast frequently have the whole of the fore-wing cell uniform yellowish.

MIMETIC ASSOCIATIONS:

Vide post. under group.

CHARAXES FULVESCENS MONITOR, Rothsch. Pl. L., figs. 1-3.

Expanse: Male, 90-100 mm., female 95-110 mm. General colour reddish-orange-brown with whitish bases to both wings. Sexes alike.

F.-w.: The costa is strongly curved, greenish at the base but darkening towards the apex; the outer margin is almost straight forming practically a right-angle with the inner margin. The base of the wing is a delicate whitish yellow with a slight greenish tinge shading into a richer orange yellow at the middle of the wing and then into a dark orange-brown up to the margin and apex, the darkest area being at the margin. The dark marginal area is ornamented with two rows of orange spots; the submarginal row extending from area 1b to 7 and following the contour of the wing; the inner row following more or less the same line but with the spots in 4 and 5 set slightly nearer the outer row. Internal to this row are two spots (sometimes one) at mid-point of cellules 5 and 6. The intermediate orange-yellow zone is decorated with wavy transverse lines, dark brownish in colour, sub-basal in 2, 3 and 4, and often at apex of cell.

H.-w.: The basal triangle of the wing is whitish tinged with yellowish green, while the distal half of the wing is orange-brown, ornamented with a row of crescentic or triangular internervular blackish lines, submarginally, while internal to this is a row of darker brown somewhat diffuse large spots, internervularly in 3 to 7, those in the latter two areas sometimes with a light centre, that in 7 occasionally being white. The dark distal areas of the front and hind wings usually have a slight purple bloom which is frequently lost in worm specimens.

UNDERSIDE. Pl. L., figs. 2 and 3.

There are two extreme forms; one in which the wings are almost uniform greyish-russet, the other heavily scaled with dark olive-brown to blackish. Both forms have a dark bar which traverses both

wings from just internal to the anal angle of the hind-wing to not quite the end of the costa in the fore-wing. This line is accentuated on the outside by a greyish lustre which suffuses the outer area of both wings.

In the pale form certain marks are constant; area 7 has a circular dark spot with a whitish centre, and areas 1c and 2 each have a white submarginal spot outlined with blackish. In both forms there are wavy black lines running transverse to the cellules, sub-basally. The venation is always green.

EARLY STAGES:

The eggs of this species are usually laid on the young shoots of two species of *Allophyllus*, *macrobotrys* and *subcoriaceus*, the former being the commoner food plant. When the egg is newly deposited it is pearly white, but as development proceeds the rim of the upper disc turns brown, and later on the whole egg becomes blackish-brown.

The newly emerged larva is olive with a black head, and white "tails" on the anal extremity. The first two instars are as in *varanes*. The fully mature larva is 6-6.5 cm. in length; the body is a dull sage-green colour, heavily papillated over with glistening white spines, simple in nature. There is no distinct body-line. Many specimens have three, others two, crescentic spots or rather blunt trident-shaped figures with the prongs pointing forwards on the dorsum of the sixth, eighth, and tenth, or sixth and eighth segments respectively. In some larvæ these marks are very distinct, in others evanescent, they may be either brick-red or grey in colour. Pl. LXXVI., fig. 5.

Pl. XLVIII., fig 5.

The head is most characteristic and resembles in front view a somewhat quadrilateral convex plate, dark-green, finely papillated, and surmounted at its upper corners by two very long 7 mm., horns which run outwards, upwards and at the tips are incurved towards the mid line. Each is cylindrical and heavily spined, and at its extremity is white with a black band immediately below. There are two other horns 4 mm. long, which arise from the sides and curve upwards and outwards; they are heavily spined and also sharp-pointed. There is no marginal border or face line. Pl. LXXVI., fig. 5.

The pupa is pale-green, with the spiracles indicated by reddish spots, as in *pollux*. The head-covering is markedly bifid, with at the base of each projection a white spot. The wing-scutæ are ornamented with greyish wavy lined, while the dorsum of the thorax is streaked with the same colour. The imago emerges in fourteen days.

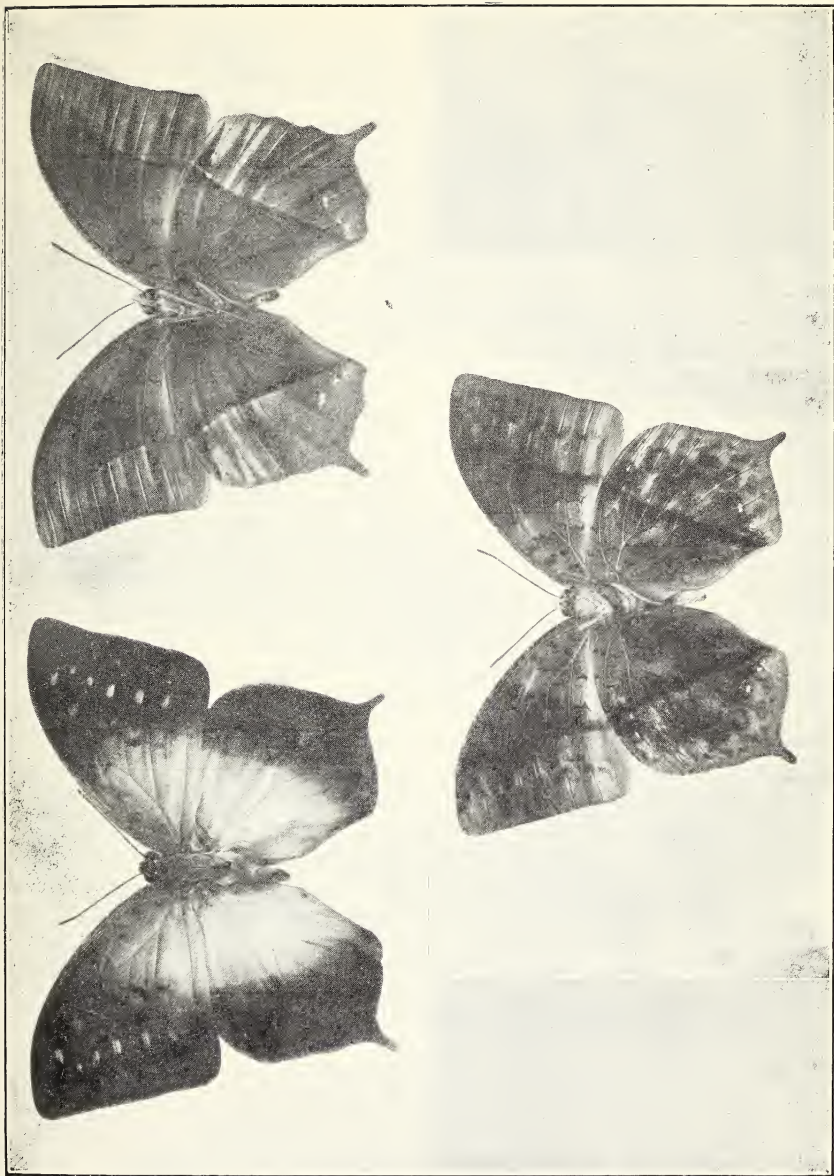


Photo: Dr. van Someren.

PLATE I.

Charaxes fulvescens monitor.

Fig. 1. ♂ upper side, Fig. 2. ♂ underside.

Fig. 3. ♀ underside.

These striking-looking larvæ are easily reared, as they feed voraciously, chiefly at night. During the day they will rest motionless on a particular leaf to which they return every morning. The surface of this resting place is spun over with silk and protected from the sun by one or two other leaves being attached and brought over with a few strands of silk. When the larva is distributed it stiffens itself into a straight line; the horns are laid on the back and the three terminal segments of the body are raised off the leaf or twig on which it is resting.

DISTRIBUTION AND HABITS:

This race of *fulvescens* inhabits the forest areas of Uganda from the Congo area to Busoga, but apparently intergrades with the form *acuminatus* in the Kigezi area of south-west Uganda, and in the Elgon area with a very distinct form which is un-named.

This species is much more confined to forests than is *varanes*, but like that species is usually found in the undergrowth and mid-zone of the forests rather than high up in the tall trees. Males are sometimes taken at bait but more frequently one captures the insects as they sit on some low bush or when feeding on some exudate from an injured tree. The undersurfaces of these insects certainly bear a strong cryptic resemblance to dead leaves, and even to the bark of trees when the insects settle on tree trunks, as they frequently do.

Very often males are seen flying about open forest glades and sunny paths but their flight is never sustained, and is rather weak.

CHARAXES FULVESCENS, *nr. ACUMINATUS*, Thureau. Pl. LI.,
figs. 1 & 2.

Expanse: Male, 88-99, females 95-112 mm. General colour blackish and orange with light whitish basal area. Sexes almost alike.

F.-w. Costa markedly curved especially at mid and distal third, with the outer margin strongly concave so that the apex of the wing is sharply pointed and tapering, while the posterior angle is produced backwards so that in shape it is less than a right-angle.

The basal area is a pale greenish-yellow shading to yellowish cream and then into orange, this area carrying large blackish-brown spots in cellules 2-6, and a streak at apex of cell. The distal area of the wing is a rich blackish-brown with a purply bloom, decorated with a sub-marginal row of smallish orange spots double in 1b and extending to 6 and parallel to the margin of the wing; internal to this row is another row from 1b-7 of much larger more triangular spots with that in 5 set slightly further out than the rest.

H.-w. Basal area bluish white distally tinged with greenish-yellow bordered distally by a band of rich reddish-orange which in turn shades to darker orange-brown at the margin. A submarginal row of rather indistinct triangular spots extends from area 1c to 7, and internal to this is a further row of larger blackish-brown spots equally indistinct, except those in 6 and 7. The distal half of the fold on the inner margin of the wing is shaded with ochreous, thus causing the basal pale area to be rather restricted. In general outline the hind-wing is rather rounded but there is a slight anal angle, while vein 4 is projected to form a rounded spatulate tail 7mm. long.

The general colour of the fore-wings is very like *Ch. candiope*.

UNDERSIDE: Highly variable. Pl. LI., figs. 1 & 2:

Two extremes are figured. The more uniform variety has the general ground colour of a greyish-ochreous-olive with a dark brownish bar crossing both fore and hind wings. This line is edged distally with a lustrous grey which colour is present also on a series of indistinct, ocellate spots which run submarginally from the apex of the fore-wing to just internal to the anal angle of the hind-wing. In this latter the spot in area 7 is blackish, while those in 1c and 2 are white with black margins. In certain specimens there is a series of small silvery streaks in the mid-internervular margin.

There are certain persistent wavy blackish lines as follows: = F.-w. one crescentic at base of cell; followed by two transverse spots at proximal edge of mid-third, and a wavy zigzag line at the distal edge of this. Two wavy lines, sub-basal in 1b and 2; one each sub-basal in 3—7. H.-w. two sub-basal in 7 and 8; one each sub-basal in 6, 5, 4, and 2; two in 1b and 1c; a series of three in the cell. These lines are constant.

In the variety with an underside suffused with blackish-brown scales, the ground colour is more tawny, while the ocellate spots on both fore and hind wings are more distinct.

EARLY STAGES: Pl. LXXV., fig. 3. Pl. LXXVI., figs. 9 & 10.

This Alpine race of *fulvescens* selects as the food plant of the larvæ a small scrub allied to that known to the Baganda as "Nkuzanyana." We have also taken their eggs and larvæ on a further species of *Allophyllus*, as yet undetermined. The eggs are similar to those of the race *monitor* but are larger and rather yellower in colour when first laid. At the first instar the young larvæ are dull brownish-olive with a black head carrying white spines. The anal "tails" are pronounced and whitish. In the second stage the head and body become more greyish-green while the head horns are well developed and strongly divergent. At the end of this stage the larva is 15



Photo: Dr. van Someren.

PLATE LI.

Charaxes fulvescens nr. *acuminatus*.

Fig. 1. a ♂ upperside. b ♂ underside.

Fig. 2. c ♀ upperside. d ♀ underside.

A



B

C



D

Photo: Dr. van Someren.

PLATE LII.

Charaxes fulvescens sb. sp.

Fig. 1. a ♂ underside. b ♂ upperside.

Fig. 2. c ♀ underside. d ♀ upperside.

mm. long and has one or two dorsal spots. The larva grows to about 30 mm. and then moults for the last time. The mature larva is very like that of *monitor* or even *varanes* but is much more ornamented with white-tipped papillæ on the body segments and possesses oblique segmental lines which reach the spiracular line which is greyish-white. The sixth, eighth, and tenth segments carry crescentic or trident-like marks which are either greyish with a bluish outline or reddish with a pale green margin. Just before pupating it measures 55 mm.

The pupa is like that of *monitor* in shape but is rather more ornamented with bluish-grey marks.

DISTRIBUTION AND HABITS.

The race *acuminatus* was described from Tanganyika Territory but we are unable to say with any certainty that the specimens referred to this form really belong to it. They agree with the description in that the angle of the apex is acute and in the concavity of the outer margin of the fore-wing, and in the darker marginal area of both fore and hind wings but these specimens differ in that the orange spotting in the fore wings is very distinct whereas Thureau describes his race as having very small indistinct orange spots. Until topotypical example are available this race must remain uncertain.

The specimens I have described range through the high forests of the Aberdares and the Kikuyu Escarpment and east to Meru and Mt. Kenya. The specimens from Kenya however differ somewhat and approach nearer to the race described later.

This race of *fulvescens* inhabits the forests and is not found in the more open country. We took it readily on bait and near its food plant. It occasionally comes to damp mud.

CHARAXES FULVESCENS *sb. sp.* Pl. LII., figs. 1 & 2.

Expanse: Male, 90-95, female 90-100 mm. This race is somewhat like *monitor* but differs constantly in having the dark outer margins of both wings much darker, though not so dark as in *acuminatus*; the orange submarginal spots are *indistinct* but the intermediate bright orange area between the whitish bases of the wings and the dark marginal border is considerably wider and thus more conspicuous than in any other race. It agrees however with *acuminatus* in having the margin of the outer side of the fore-wing concave with the apex produced to an acute angle.

The white area of the base of the fore-wing is limited to the base of area 1a and slightly into 1b.

I should not be at all surprised to find, when more material of true *acuminaus* is available, that the specimens described above belong to this form and that the Uplands specimens represent an entirely distinct race.

DISTRIBUTION: This type of insect is found in the forests round Mt. Elgon south to Nandi and Mau and eastwards to the Kericho and Sotik area.

GROUP 2. *CANDIOPE*.

Only one species of this group is represented in Kenya and Uganda. The sexes are similar and both possess two pairs of "tails" those in the female being more developed than in the male. The veins are greenish.

The basal half of both fore and hind wings is greenish-yellow.

The outer edge of the fore-wing is concave and the apex produced to an acute angle.

CHARAXES CANDIOPE CANDIOPE., Godt. Pl. LIII., figs. 1 & 2, a—d.

Expanse: Male 90-95, female 95-110 mm. General colour yellowish-green at base of wings with brown and black margins.

F.-w.: The basal half of the wing greenish-yellow up to a line with the apex of the cell; beyond this a reddish-orange zone extended outward in areas 5 and 6; distal half of wing blackish-brown ornamented with a marginal row of orange marks diminishing in size from the posterior angle to the apex, and a further row of 7 large submarginal orange spots following the contour of the outer margin up to area 5 and then curving inwards at 6 and 7. Beyond the apex of the cell are three confluent black spots and beyond these, two spots at the bases of 5 and 6.

H.-w.: Upper half of basal area greenish-yellow, shading to red-brown at the lower half, and distally bordered by orange-brown. The margin of the wing is paler orange and internal to this is a black band diminishing in width from the upper angle to area 2 where it tails off in a black spot. This black band is ornamented with orange internervular spots. The anal angle is produced into a blunt point carrying an olive-green mark in the centre of which are two black dots and edged above and below with white. Vein 2 is produced into a long outwardly-curved spatulate tail, and vein 4 into a narrow pointed tail; while veins 5 and 6 are also slightly produced. In the female both tails are long and spatulate, and of about equal length.

A



B

C



D

Photo: Dr. van Someren.

PLATE LIII.

Charaxes candiope candiope.

Fig. 1. a ♂ upperside. b ♂ underside.

Fig. 2. c ♀ underside. d ♀ upperside.

UNDERSIDE. Pl. LIII., b and c.

The green venation, especially that of the costa is marked. The pale area of above is represented below by a triangular basal area, greenish-ochreous in colour distally bordered by a greyish-brown bar which crosses the wing from the costa to the hind-margin. This bar is distally outlined and shaded with black in 1a to 3. Beyond this the wing is a paler greyish-brown paling to ochreous in 1b and 2, these areas ornamental with black spots, which are represented in the other cellules by faintly indicated double lines.

The pale basal area is traversed by blackish-brown wavy lines as follows: Three lines crossing the cell; two at the base of 2; two at the base of 3, while crossing the apex of the cell is a diffuse brown mark bordered distally by a brownish area. Towards the apex of the wing are two greyish marks below the costa.

H.-w.: Upper part of base greenish; the whole of the cell, the bases of 2, 4, 5, 6, and sub-basal in 7 and 8 dark brown, forming a bar; this bar is distally bordered by a cream bar of equal width. The rest of the wing is greyish-brown with a purple tinge traversed by a brownish bar composed of crescentic marks in each cellule, each mark proximally shaded with ochreous and the whole outlined in blackish.

The extreme margin of the wing is brown internally bordered by a series of ochreous crescentic marks in 4-8 and by greyish-olive in 1c, 2, 3, and 4, the first of these carrying two black dots, the latter one dot each. The under-surface of the tails is brown like the border. Areas 1b and 1c are traversed by dark grey lines, two in the former, three in the latter. The above description is of an average well marked example; the undersurface is however somewhat variable, many specimens being almost uniform greyish with a distinct sheen, but with the essential markings faintly indicated.

EARLY STAGES. Pl. LXXII., fig. 5.

This species lays its eggs on the upper or lower surface of the leaves of the "Brown Olive," *Croton megalocarpus*, Hutch. (*Elliotianus* Pax et Engl.) Euphorbiaceæ, a common tree of the highland forests of Kenya and known to the Kikuyu as "Makinduri" and at the Coast on *Croton dichogamus* Pax., a shrub which seldom grows to more than 6 feet and known to the Wanyika as "Mnyama." We do not know the food-plant in Uganda, but it is probably a species of *Croton* or a near ally. The eggs are deposited with great rapidity, not all on one leaf or even one tree, but the time between the actual settling and the deposition cannot be more than a second; and off the insect goes to another tree. When first laid the eggs are bright canary yellow, but they soon turn dull yellow with a brownish ring at the edge of the disc and in a day become bright brick-red.

This colour is highly cryptic, agreeing absolutely in tint with the numerous spots of fungus-burn to which the leaves of the *Croton* are especially liable. Just before the larva emerges, the egg turns black.

The egg stage lasts eight to ten days. The young larva (Pl. LXXIV, fig. 4) is at first dull olive-yellow, with black head, numerous very fine papillæ over the body segments and a pronounced bifid tail. At the first moult it becomes greener and the tail is reduced in length, but the horns on the head are well developed and very divergent. At the second moult the dorsal spots make their appearance on the sixth and eighth segments. At this stage the number of spots is not constant, but the usual number is three to each segment. The head is now green, with white papillæ and surmounted by greyish-brown strongly divergent horns. In the last stage the larva is leaf-green, with the under surface grey-green the whole finely papillated. A yellowish line runs the length of the body from the second segment to the tail, separating the green dorsum from the greyish under-surface. This body line subsequently becomes pink and each segment bears a row of pink or yellow spots along its anterior edge. The tails are ochreous in colour (Pl. LXXIV., fig. 1). The head is characteristic (Pl. LXXVI., fig. 21), being rather oval in outline but slightly pointed towards the mouth. The lower horns arise at about two-thirds up the side and are set well out and then curve slightly upwards. They are, as usual, separated from those of the inner pair by small spinous processes. The inner horns are almost straight and very divergent—more so than in any other *Charaxes* larva we have reared.

Two short spines arise, one on either side of the mid-line. The facial disc is green in colour with the horns and entire margin yellow-ochreous tinged with grey. The dorsal spots, situated on the sixth and eighth segments are also characteristic of the species. Each segment bears three spots set transversely, two small ones laterally with a large one in between; that on the sixth is larger and is composed of three contiguous parts, a long oval anteriorly, then a narrower but equally long section, at the rear of which follows a short oval. The central spot on the eighth segment is made up of two long, narrow, contiguous ovals with smaller ovals fore and aft. The lateral spots are almost circular. All the spots are ochreous in the centre and white outwardly. The tails on the last segment are fairly long and ochreous in colour. The larval stage lasts about twenty days in the Highlands, but the period depends largely on the freshness of the food-plant. Only mature leaves are eaten.

The pupa is very like that of *cithæron*, but is smaller, with a more marked thoracic ridge, and the bluish-white shading over the wing-scutae and the thorax more in evidence. Furthermore the

eremaster is of a different shape. The insect emerges in fifteen to twenty days.

DISTRIBUTION AND HABITS :

Charaxes candiope is found from the Coast, throughout Kenya and practically over the whole of Uganda. It is a forest species which also frequents the more open "park-country" and bush-veldt where its food plant happens to be growing. It is the commonest species of *Charaxes* in the Nairobi district, and while the males come readily to evil-smelling baits and are to be seen flying and feeding, the females are only slightly less common though not nearly so much in evidence. These latter keep more to areas where the food-plant is plentiful and can usually be found feeding on the exudate from wounds in certain trees. These butterflies are particularly pugnacious towards others of their own kind and different species. They will fight with striking fierceness over some particularly attractive juice from a wound in a tree, or some unsavoury animal dropping, battering each other with their wings and sidling one another off the choicest tit-bits. One frequently comes upon an old male with denuded remnants of wings which have been so destroyed as to make flight well-nigh an impossibility. This species is particularly long-lived, and will survive in captivity for well over a month. They will feed well on over-ripe fruit, especially bananas, papaya and pineapple.

MIMETIC ASSOCIATIONS OF THE GROUPS :

Before proceeding to the next group it will be of interest to review what is known or rather suspected, regarding "mimicry" in these groups.

Professor Poulton has dealt at length with mimicry in the Genus *Charaxes* in his paper read before the International Entomological Congress, 1925. We cannot do better than quote certain passages from this address. "In the genus *Charaxes* we are introduced to a novel aspect in butterfly mimicry; for both models and mimics are regarded . . . as among the most palatable of insects. Yet there can be no doubt about the fact that the large species of this genus are mimicked by the smaller ones, and that some of the larger species mimic each other." "The species of *Charaxes* are strongly built and extremely powerful in flight, the thorax, containing the wing muscles, being specially capacious."

"When a *Charaxes* is seized its great strength enables it to struggle violently, and the effect is almost certainly intensified in the larger species, by the serrated costa of the fore-wing.

Swynnerton found that the chitinous exoskeleton is so tough that an insectivorous bird will often abandon a *Charaxes* after spending

perhaps twenty minutes in the vain attempt to remove the wings. Repeated observations have convinced him that with alertness and power of flight, "fighting weight," and toughness of integument. *Charaxes*, in spite of its palatability, gives to its smaller enemies such an unpleasant experience that they will avoid a repetition of it except under stress of hunger, and on this account the mimetic resemblance is advantageous."

"Mimicry in *Charaxes* is generally confined to the upper surface of the wings and is principally, although by no means exclusively manifested by the females. The fact that some of the larger species, which act as models for the smaller, are themselves mimics of other large species, and that one sex of a species may be a mimic while the other sex is a model, supply evidence that the resemblance is an advantageous advertisement of protective qualities held in common, although different degrees, by models and mimics."

In the *varanes-fulvescens* association we have a compact group of species all conforming to a common outline and presenting on the upper surface a somewhat similar scheme of colours.

The species comprising this association derive mutual benefit due to "the protective qualities held in common," a tough integument, power, and strong fighting tendencies.

Associated with these species are certain others belonging to other groups, such as *Ch. lactitinctus* (q.v.) female *Ch. azota*, *Ch. protoclea*, *Ch. candiope*, and *Ch. homeyeri*, and the female of *Palla ussheri interposita*, Joicy and Talbot, a species belonging to a genus closely allied to *Charaxes*.

In the more open and savannah forests we find *varanes. lactitinctus*, *azota*; in the thicker forests, *fulvescens*, *candiope*, and *Palla*.

GROUP 3. CYNTHIA GROUP.

CHARAXES PROTOCLEA NOTHODES, Jordan. Pl. LIV., fig. 1 and 2.

Expanse: Male 95-100 mm., female 100-110 mm. General colour black and orange-red. Sexes unlike.

F.-w.: Almost uniform velvety-black with a purply bloom, with the distal margins of 1a and 2 and slightly in 3 carrying an orange-red border. The fore part of the thorax covered with an orange-red pubescence. H.-w.: Base with a large triangular black area, rest of wing orange-red; veins 2 and 4 projecting to form short blunt tails; the ends of the remaining veins slightly produced forming obtuse serrations



Photo: Dr. van Someren.
and Capt. Stoneham.

PLATE LIV.

Charaxes protoctlea nothodes.

Fig. 1. a ♂ underside. b ♂ upperside.
Fig. 2. c ♀ upperside.

round the margin. Fore and hind-wing with white scales, inter-nervularly along the extreme margin. There is a black dot towards the border of 1c.

UNDERSIDE. Pl. LIV. A.

F.-w.: Dull chestnut, with rusty red markings as follows: A transverse mark almost at the base of the cell, followed by a dot. and at about the mid-point a wavy line extending across the cell: followed by another wavy line at the apex. Area 1b with a blackish U-shaped mark sub-basally, and the blackish mark shaded with grey towards the border bordered proximally and distally with orange or rusty red. Area 2 carries two rusty-brown marks, one at the base, one sub-basal; areas 3-7 each with a rusty transverse line towards the base. There is a series of ocellate rusty marks submarginally in areas 2-8. There are two whitish marks at the apex, in 7 and 8.

H.-w.: Dull chestnut, the basal triangle traversed by two wavy rusty lines; the inner line transverse to the bases of 6 and 7 and crossing the cell at about mid point where it bifurcates; the outer starting at about the mid-point of the costa cuts across areas 7, 6, and 5 and through the bases of 4, 3, and 2 to become diffuse in 1c. The series of ocellate spots of the fore-wing is carried on in the hind-wing but the spots are rusty-brown distally, bordered internally with lighter brown. The marginal border is rusty, and internal to this each internervular area carries a white dot, duplicated and outwardly black in 1c.

FEMALE. Pl. LIV., fig. 2.

F.-w.: Ground colour dark brownish-black, rufescent along the base of the costa. Margin of the wing with large coalescent orange spots forming a border; Ala bar broad and white in 1a and 1b, distally tinged with yellow; in 2 and 3 the bar is split, the inner spots are white and the outer yellowish-orange; the outer spots are continued as detached yellow-orange marks in 4-7 in a curve; there are two white spots towards the sub-base of 5 and 6.

H.-w.: Basal area blackish-brown; mid area with a very wide white patch very slightly tinged with yellowish distally, and bordered by a black band with very serrated outer margin, the serrations extending along the veins into the orange-yellow marginal border: margin of wing not serrate; vein 4 with a blunt stout tail, vein 2 with a very much shorter blunt tail. The anal angle with two white dots. with bluish tinge.

EARLY STAGES: Unknown to us.

DISTRIBUTION AND HABITS:

This species is limited to Uganda and does not appear to extend south-east of the Elgon area. It is not by any means plentiful. It is a forest species in which the males seem to predominate; the female being rare. No doubt, owing to their more retiring habits they are less evident.

MIMETIC ASSOCIATIONS:

Ch. Protoctlea is a very powerful insect and acts as the model of a very small species *anticlea*. The female enters the *varanes* association.

CHARAXES PROTOCTLEA AZOTA, Hew. Pl. LV., figs. 1 and 2.

Expanse: Male 86-92 mm., female 90-96 mm. Sexes unlike. General colour of male black with orange-red border. Female white with orange and black border.

F.-w.: Male. Outer margin of wing with a wide orange-red border, 7 mm. wide at the hind-angle at 1a-4, thence represented by two rows of spots, one marginal to the apex, the other in an inward curve to just below the costa. The orange in area 1b contains two black dots, 2-4, one each.

H.-w.: Basal triangle black, but not extending to the inner marginal-fold; rest of wing orange-red. The margin of the wing is slightly dentate at the nervures, veins 2, and more so 4, bearing short obtuse tails. Area 1c has two black and white dots sub-marginally: while the extreme margin of both wings is narrowly edged with black with white scaling at the mid-point in each area.

UNDERSIDE:

Fore and hind-wings dull chestnut with a lustre-like broad band which traverses the central line of both wings and turns upwards along the h.-w. inner marginal fold. This band is edged on both sides with rusty-brown, the distal edging on the hind-wing being as wide as the band. The hind-wing is narrowly margined with rusty-brown; while on the fore-wing the orange of the upperside is represented by rusty-red. A black U-shaped mark is present towards the base of 1b in the fore-wing and continuous with each arm of this mark a rusty-brown lines the outer corresponding with the inner edging to the fore-wing bar, the inner arm crossing the cell just beyond its middle: within the cell and internal to this line are two other rusty lines, a

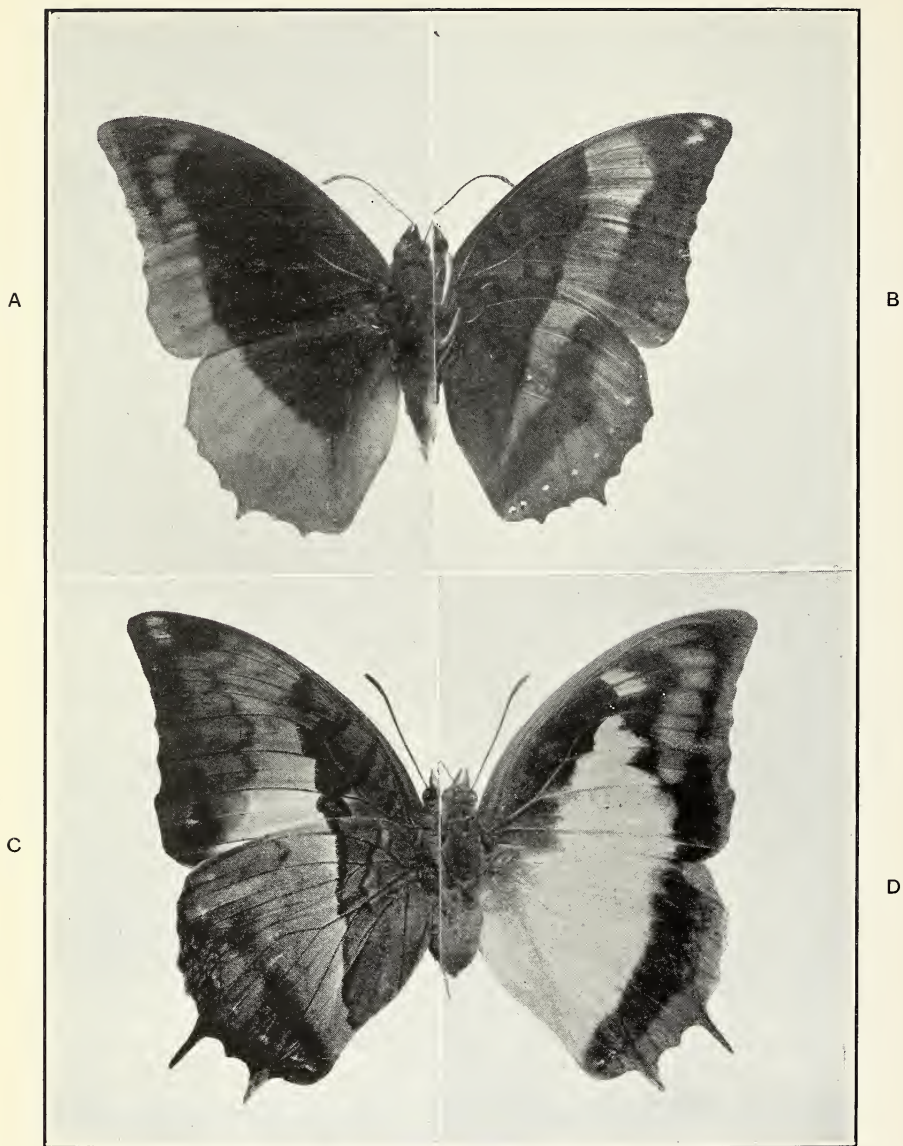


Photo: Dr. van Someren.

PLATE LV.

Charaxes protoeclea azota.

Fig. 1. a ♂ upperside. b ♂ underside.

Fig. 2. c ♀ underside. d ♀ upperside.

fourth line crosses the apex of the cell. There are two purple-grey spots near the apex of the wing, and two sub-marginal in 1b. In the hind-wing there is a row of sub-marginal white dots set mid-way in the internervular spaces. The hind-angle is olive yellow with two black and white dots.

FEMALE. Pl. LV., fig 2.

F.-w.: Ground colour, brownish black. Costa and outer margin of wing orange-red; a broad submarginal bar of orange-red extending from upper half of 1b to below the costa in 7. A large irregular triangular white patch tinged with yellow at the apex, fills the mid-area of 1a, 1b, and the sub-basal areas of 2 and 3. Two yellow-ochreous rectangular marks are present just internal to the mid-point of 5 and 6.

H.-w.: Mostly white, with a slight brownish-black suffusion at the upper part of the base of wing. Margin with a wide border of orange-red, with the extreme edge outlined with black, this black line broken at the mid-internervular point with white scaling. Internal to the orange border is one of brownish-black of about the same width. edged on the inner side at its upper end with orange and carrying at the anal end two white dots outlined with black. Vein 4 is extended into a long tail, 10 mm., and vein two into one of almost the same length.

UNDERSIDE:

Basal thirds of fore and hind-wings greyish-brown, sharply demarcated from the mid third which is ochreous-yellow shading into ferruginous-yellow on the distal third. The basal area of the fore-wing is crossed by rusty-brown lines as follows: One sub-basal in the cell followed by two spots and at about the mid-line of the cell a transverse bar which is carried on through the base of 2 to join a black mark in 1b thence to pass up sub-basally into 2 and 3, and cross the apex of the cell and the base of 4. A further rusty bar crosses the sub-basal areas of 5-7. The black sub-marginal line on the upper surface of the wing is faintly indicated on the lower surface, commencing in two whitish spots near the apex and ending in a black mark with a white dot in area 1b. In the hind-wing the distal edge of the brownish area is outlined with rusty-red, while a second brown line crosses the sub-basal area of 7 and 8 and crosses the cell. The ferruginous-orange border is shaded along the mid-line with greyish scales which impart a lustre to this area, while the distal margin of this greyish zone carries triangular white spots placed centrally in each cellule. The anal angle carries two black dots outlined in white above.

EARLY STAGES :

We have not as yet completed the life-cycle of this *Charaxes* but have on many occasions detected the female depositing her eggs on the mature leaves of the "Mbambakofi," *Azelia cuanzensis*, Welw. (Leguminosæ). Owing to the difficulty of keeping up a supply of fresh leaves, at Nairobi, we have not taken the larvae beyond the second moult. Rogers however describes the mature larva as being of the usual *charaxes* shape, green in colour, with the head bordered with brown. The spiracular line is orange, the tubercles being more orange. The green of the body has a somewhat mottled appearance which changes before pupation into dull yellow, with a row of large lateral ill-defined brown spots. The dorsum of the sixth segment is ornamented with a large triangular orange-brown mark, the apex directed backwards. The pupa is pinkish with chocolate-brown markings.

DISTRIBUTION :

The race *azota* is found at the Coast and along the Tana River, but actually how far inland it extends we have no accurate knowledge.

It is a forest species and somewhat uncommon. We have taken the male at bait and leopard droppings.

MIMETIC ASSOCIATION :

As has already been mentioned, the female of *azota* comes within the *varanes* mimetic association; there being an undoubted superficial resemblance between the species when seen in flight.

CHARAXES BOUETI LASTI, Gr.-Sm. Pl. LVI., figs. 1 and 2.
Pl. LXVII., fig. 1.

Expanse: Male, 72-75 mm., female 80-90 mm. Sexes unlike. General colour of male orange-red with black marginal markings; female orange with black markings and yellowish central wing-bar.

F.-w.: Male, general ground colour orange-red slightly darker at the basal third; apex and outer margin with a broad blackish border, broken by a series of graduated orange spots largest in 1b and smallest at the tip of the apex. There is a sub-apical row of four orange spots arranged in a curve and continuous with an orange-red bar which traverses the wing to the hind-margin. Areas 2-6 are ornamented with blackish sub-basal lines and spots, with a further row of irregular black marks at the apex of the cell.

H.-w.: Orange-red, with a central ala bar of slightly lighter shade; extreme margin of the wing outlined in black, with white scaling in the internervular spaces. A sub-marginal series of graduated



Photo: Dr. van Someren.

PLATE LVI.

Charaxes boueti lasti.

Fig. 1. a = ♂ upperside. b = ♂ underside.

Fig. 2. c = ♀ upperside. d = ♀ underside.



Photo: Dr. van Someren.

PLATE LXVII.

- Fig. 1. ♂ *Charaxes boueti lasti*, var., upperside.
Fig. 2. ♂ *Charaxes castor flavifasciatus*, upperside.

black spots largest at the upper angle extends to the anal angle. The anal angle is olive and carries two black dots accentuated with white above. The outline of the wing is serrate, with veins 2 and 4 extended into tails 4-6 mm. long respectively. The bases of areas 6 and 7 are sometimes dusted with blackish scales.

A not infrequent variety of male has the whole ground colour pale as in the female but lacks the central yellowish ala-bar. The spotting is so much more definite and the black on the outer margin of the fore-wing is reduced to a series of submarginal spots, vide Pl. LXVII., fig. 1.

UNDERSIDE:

Two types predominate, that with a pinkish-ochreous ground colour with the markings ill-defined and with the silvery-white line of the hind-wing narrow and interrupted; and the other in which the ground colour is greyish-ochreous with spots and lines as follows: The cell is traversed by a sub-basal crescentic line beyond which are two rectangular rusty spots followed by a wavy line just distal to the mid-point; at the apex of the cell is a hook-shaped line. In area 1b is a large bluish-grey mark proximally and distally bordered with black, and at the distal end of the area is a black mark distally intersected by three bluish-white marks in the form of a trident. Sub-basal in 2 is a rusty line continuous with the inner line of the inner spot in 1b, while in line with the outer black edge of this spot is a series of rusty lines crossing 2, 3, 5, and 6.

The hind-wing is divided by a pronounced silvery-white line which starts at about the mid-costa opposite the inner of the two spots in 1b of the fore-wing, and extends almost to the anal angle where it curves slightly inward to the fold of the wing. The base of the wing carries a looped line which passes through the base of 8 and 7 thence obliquely through the cell then curves abruptly upward, traverses the cell and crosses the base of 7. A further rusty line passes the apex of the cell and joins the rusty-brown line which borders the inner margin of the silvery ala line. The extreme margin of the wing is black, bordered inwardly with orange-red then bluish-white, while internal to this is a series of white spots in the mid-internervular line of each area. The anal angle is olive green with two black spots edged above with white. There are a few variable rusty-brown marks in the post-discal area of the wing.

FEMALE. Pl. LVI., fig. 2.

The distribution of the blackish spots is similar to that of the male, but the ground colour of both fore and hind-wings is lighter orange-red, while the marginal orange spots in the fore-wing are large and almost confluent. Both fore and hind-wings are traversed by a

broad yellow ala bar, widest at the costa of the fore-wing and tapering to a point at the middle of the inner margin of the hind-wing. The tails to the hind-wing are long and fine, usually 9-10 mm. in length.

UNDERSIDE:

As in the male, but the rusty markings are larger, and the yellow bar of the upper side is indicated on the lower, but is distally shaded with rufescent scaling. There is a variety with very large triangular black spots, which coalesce and form a submarginal bar to the hind-wing.

EARLY STAGES:

We have observed this species laying on *Afzelia cuanzensis*. "Mbambakofi," but so far have not succeeded in rearing the insect to the imago.

DISTRIBUTION AND HABITS:

The range of this insect appears to be the Coastal zone, and along the Tana River, but only in the forested areas. It is a common species and not very robust. It is less active than many *Charaxes* and spends a lot of time in basking in the sun or sailing about some sunlit forest clearing. The males come to bait readily and females are attracted by fermenting fruit-juices. These latter are almost as much in evidence as the males.

MIMETIC ASSOCIATIONS:

There are no very close mimetic associations connected with this species. The males bear a superficial resemblance to the very common *Euryphebe senegalensis orientalis*.

CHARAXES CYNTHIA, Butlr. Pl. LVIII., figs. 1 and 2.

Expanse: Male 80-86 mm., female 98-100 mm. Sexes unlike. General colour of male black with orange-red markings; female black with yellow ala bar crossing both wings.

F.-w.: Basal half of costa and the whole of the cell and bases of 4, 5, and 6, orange-red, so also the bases of 1a and 1b and extreme base of 2. Rest of the wing black with a broad ala bar of contiguous orange-red spots commencing and widest at the mid-point of 1a and extending in diminishing size to 4. In areas 5, 6, and 7 the spots tail off, and between them and the basal spots are two rectangular orange spots, double in 1b.

H.-w.: Ground colour black, slightly shaded with brown at the base. The ala bar is continuous with that of the fore-wing and shades off into the wing-fold in 1c. The margin of the wing carries



Photo: Dr. van Someren.

PLATE LVIII.

Charaxes cynthia.

Fig. 1. a = ♂ underside. b = ♂ upperside.

Fig. 2. c = ♀ underside. d = ♀ upperside.

a wide orange-red border, dentate on the inner edge, while the extreme edge of the wing is margined with black with white spots internervularly. The margin is slightly serrate, with veins 2 and 4 carrying short sharp tails 3-4 mm. in length.

UNDERSIDE:

The general tone of the underside is greyish-brown but in the cell and the line corresponding to the orange spots of above, the ground colour is shaded with ochreous, while most of areas 1a and 1b of the fore-wing are bluish-white with a purply tinge. The fore-wing markings are as follows: Three thick rusty-brown wavy transverse lines in the cell with a hook-shaped mark at its apex; a wavy line starts at the base of 7 and crosses 6 and 5; in 1b are two large black lines set at an angle, from the inner of which a line crosses the base of 2, while from the outer, the line crosses 2 and 3 just internal to the orange-ochreous ala bar; this bar is diffuse and is bordered internally by crescentic rufescent marks, and distally by spots of the same colour. The distal end of area 1b carries a large black spot lined externally with three purply-blue marks.

H.-w.: Traversed by a straight silvery-white ala bar which runs from the mid-point of the costa to just above the anal angle. This bar is bordered distally by a wavy chestnut line and then by one of grey, and, this in turn by a wide 3mm serrate bar of greyish-chestnut. The edging to the wing is very narrowly black with white in the mid-points, while the marginal border is orange—or ferruginous; the intervening area between this and the serrate bar is greyish-purply-brown bearing at the mid-point of each area an indistinct pinkish-white triangular spot. The basal triangle of the wing is greyish-brown with a light purply-grey line outlined with chestnut on either side, extending from the base of 8, 7, the cell, and into 1c and joining the ala bar before its end; a further wavy rusty line crosses area 9. The anal angle is olive, carrying two black and white dots.

FEMALE. Pl., fig. 2.

F.-w. Orange-red area similar to the male; marginal series of spots larger and more pronounced. Ala bar yellow-ochre, and wider otherwise as in the male.

H.-w.: Pattern as in male but ala bar ochreous yellow; and the orange marginal border inwardly bordered by a series of small white dots, double in 1c. Margin of wing serrate; vein 2 with a short 5 mm. outwardly curved tail; vein 4 with a long inwardly curved spatulate tail 8-10mm long.

UNDERSIDE:

The general ground colour is more purply-grey-brown than in the male but the actual distribution of the markings is the same with the

exception of the ala-bars on the fore and hind-wing; these bars are ochreous-yellow and though as broad as on the upper-surface are less defined distally, being shaded with irregular shaped rusty-brown marks.

EARLY STAGES :

We have not succeeded in breeding this species, and there appears to be no published description of the life history.

DISTRIBUTION AND HABITS :

This species is common in Uganda in forest areas. The males are much in evidence on any bits of mammal droppings and are readily attracted to bait.

We have taken *cynthia* in Western Uganda, eastward to the Nandi and Maragoli Hills. It appears to be a forest species and though males are to be seen in forest clearings and along roads which traverse forest, the female are much more retiring and usually keep to the more open undergrowth and forest edges.

Although the males are only of moderate size, they are very powerful and keep many other larger species from feeding on a particularly choice foul-smelling titbit; they use their wings with force by beating downwards and make great play with the serrated edge on the fore-wing costa. The females are very partial to the juice from banana flowers and to the sap from certain leguminous trees.

MIMETIC ASSOCIATIONS :

There is in the male a remarkable resemblance to *Ch. lucretius* and to two apparently undescribed species or forms which occupy the Elgon-Nandi area. The pattern and colouration in these insects is so close that one cannot with certainty "place them" except by looking at the under surfaces. The four species form a close mimetic group.

When we consider the females we find that there is a strong similarity between *cynthia* and *lucretius*, and I have no doubt that when the Elgon females are known they will prove to belong to this group. In West Africa a form of *Ch. etheocles* female *ochracea* enters the group.

It is highly probably also that the female colouration has been influenced somewhat by the presence of *Ch. catsor*.

GROUP 4. LUCRETIVUS GROUP.

CHARAXES LUCRETIVUS. Cram. Pl. LIX., fig. 1 & 2.

EXPANSE: 90-92mm, female 90-100 mm. Sexes unlike. General colour of male black with orange-red bar and border; female with a whitish bar.

A



B



Photo: Dr. van Someren.

PLATE LIX.

Charaxes lucetius.

Fig. 1. ♂ upperside. Fig. 2 ♂ underside.

F.-w. : Male, ground colour purply-black, basal half of costa, the cell and the bases of 1a-2 and 5 and 6 rufescent-brown with violet tinge; the cell with two black bars outlining the mid-third. Outer margin of wing with a dentate orange-red border; an almost straight ala bar of orange-red spots crosses the wing from 1a-7.

H.-w. : Ground colour purply-black with a slight brownish tinge at the base; extreme margin with a narrow black border with white at mid internervular point, internal to which is a wide orange-red border tinged with violet and with inner margin indented by the black ground at the veins; an ala bar continuous with that of the fore-wing starts at the costa and runs towards the anal angle where it merges into the ground colour. The anal angle has an elongate black mark with two white dots bordered with purple. Outline of wing slightly serrate—veins 2 and 4 carrying tails 3-4 mm. long.

UNDERSIDE. Pl. LIX., fig. 2.

F.-w. : Ground colour yellowish-brown at the base shading to purply-brown towards the tip. Marginal and ala bar of upperside represented by indistinct orange-brown scaling. Black marks as follows: the cell is traversed by three lines, one sub-basal, two outlining the mid-third of the area. A broad black line crosses the sub-basal part of area 1b, while a wavy black line crosses at about mid-point; directly above these lines are others which cross area 2; these areas are further ornamented with black marks sub-marginally, that in 1b having three purply violet streaks on the distal edge. The hind-wing is purply-brown with darker brown scaling along the line of the ala bar. The marginal border is red-brown with a narrow black distal edge; and internal to this border, at each mid-internervular space is a small purply-pink spot, double at the anal angle and distally edged with black. The wing is traversed by narrow wavy black lines edged with white, the outer commencing at about the mid-point on the costa and passing to just above the anal angle when it curves inward to the wing-fold; a second line crosses the sub-basal areas of 8, 7, and the cell, this last area with a further line at midpoint.

FEMALE :

We have no female specimen and quote from Seitz. "In the female both wings above are smoke-brown with common whitish discal band, placed as in the male but much narrower; the marginal spots of the fore-wing very small or indistinct; the marginal band of the hind-wing much narrower than in the male and whitish with orange-yellow tinge; the base of the costa of the fore-wing only very narrowly red-brown; the under surface lighter than in the male and with a whitish discal band, which is broader than above."

EARLY STAGES:

Unknown.

DISTRIBUTION AND HABITS:

Ch. lucretius is wide-spread in the western parts of Africa but as it comes east it is certainly uncommon. We have taken it in Eastern Uganda and Uganda proper and at Masindi. It is nowhere common; it may be, that owing to its close resemblance to *Ch. cynthia*, it has been overlooked. It is a forest species which flies high, but can usually be attracted to baits of various kinds. The females are very retiring and keep to the forest undergrowth. Only once have we seen the insect as it slipped away in the dense bush.

MIMETIC ASSOCIATIONS:

These have been referred to under *Cynthia*. There is a close resemblance between the females as well as the males. The resemblance is limited to the upper surfaces, the undersides being quite different in the two species.

CHARAXES LACTETINCTUS, Karsch. Pl. LX., figs. 1 and 2.

Expanse: Male 88-90 mm., female unknown to us. General colour white and black with rusty tips.

F.-w.: Basal triangle except costa bluish-white, with the distal half of 1a-3, black, intersected by an orange ala bar which starts below the costa at 7 and ends in the upper part of 1b. Marginal border orange-red as also the base of 4, and sub-bases of 5 and 6; costa, upper part of cell and rest of apex of wing, rufescent-brown shading into the black of 3.

H.-w.: Basal half bluish-white shading to orange-red at midpoint in 6-7 and along the fold on the inner margin; remainder of wing, black with a marginal border of orange-red as far as vein 3, this narrowly edged on distal side with black; the anal angle, and 2 and 4 with oblong purple-blue submarginal marks; margin of anal angle olive-green; vein 2 carries a long slender tail 7 mm. long and vein 4 one of 5 mm.; margin of wing not very serrate.

UNDERSIDE:

F.-w.: Rusty brown with slight indication of the ala and marginal orange of upper side. A wide silvery white line crosses areas 5-7 sub-basally; a similarly coloured line crosses the cell at the distal end of the mid-third and passes across the sub-basal area of 2 where it is accentuated distally by a black line. The cell is further crossed by black lines distally edged with white at the inner edge of the mid-third and sub-basally. There is a sub-basal spot in 1b, and a series of black lines along the inner margin of the ala bar, crossing 1b-3; areas 1b and 2 carry submarginal black spots distally outlined in purple white.



Photo: Dr. van Someren.

PLATE LX.

Charaxes lactetinctus.

Fig. 1. ♂ upperside. Fig. 2. ♂ underside.

H.-w. : The hind-wing is almost unicolourous purply-brown; there is an ill-defined bar of deeper brown crossing the wing from the mid-point of the costa to just above the anal angle; this bar is edged internally with bluish-grey scales, especially at the anal angle. The marginal border is along its upper half rufescent, but from the tail at vein 4 to the angle it is olive-green inwardly margined with pinkish-blue and distally outlined with black and white; the anal angle has two black dots, areas 2 and 3, one each.

FEMALE:

Unknown to us, nor is it described in "Seitz."

EARLY STAGES:

Unknown.

DISTRIBUTION AND HABITS:

Lactetinctus is apparently a rare species which, within the regions dealt with in this paper, is limited to the northern districts of Uganda and to the eastward as far as Lake Rudolf.

It is an inhabitant of the acacia and thorn-bush country, and not a forest species. One usually sees the males flying high up or settled at the top of some particularly nasty thorn-tree, in both cases making capture rather difficult. The species is one of the finest of the group, is powerful of flight and extremely wary. More than once I have had to actually shoot the insects with a reduced charge from a .410 gun, they would not come within reasonable distance of the net, but kept twenty or more feet above the ground, sailing leisurely about or flirting with any other species of butterfly which happened to come within their territory. They undoubtedly keep to one particular area and can be seen within that sphere for days on end but always out of reach. Carpenter writes: "I saw about eight *lactetinctus* and nearly broke my neck by gazing at them! They would settle out of reach, or, if within reach would not allow me to strike at them. . . . They are most wonderful fliers: even among *Charaxes* they are *primi inter pares*! Two will go soaring away into the blue sky, buzzing round and round each other, till lost to view."

MIMETIC ASSOCIATION:

I have already dealt with this under the *varanes* group, q.v.

GROUP 5. JASIUS GROUP.

CHARAXES JASIUS EPIJASIUS, Reiche. Pl. LXI., figs. 1 and 2.

Expanse: Males, 80-95 mm., females 95-102 mm. General colour black with ochreous border.

F.-w.: Male, almost entirely deep blackish-brown with slight purple tinge; with at the margin of the wing a wide ochreous-yellow border, widest at the posterior angle and extending up to the apex in gradually decreasing width, the border being reduced to spots from 5-8. The veins are black. Many examples have a sub-marginal line of indistinct orange spots, mostly in evidence in areas 3-7. One not infrequently obtains a male in which the ochreous border is heavily dusted over with brown scales, with the veins widely scaled with the same colour and the extreme ends with triangular black marks.

H.-w.: Basal half brownish-black with a blue area filling most of areas 1c-4 and extending to 5 and 6 as blue spots. Areas 6 and 7 sometimes have an ochreous bar at about the mid-point. The wing carries a wide ochreous-yellow border, tinged with greenish in 2 and almost entirely green in 1c at the anal angle. This marginal border is outlined outwardly and inwardly with black. The extreme margin of the wing is serrate and edged with white. Vein 2 carries a long outwardly-curved tail 10-12 mm. long, while at vein 4 the tail is 7 mm. long and curves inwardly.

UNDERSIDE:

The lower surface is highly ornate. F.-w.: At the base of the wing the ground colour is reddish-chestnut shading to orange-ochreous towards the apex. The marginal ochreous of the upper-side is represented by a rather pale ochreous border, gradually deepening in shade towards the apex; the internervular areas are blackish at the margin. The row of indistinct orange spots of above is represented by a continuous series of orange spots on a grey ground, each spot inwardly and outwardly accentuated by a black spot, that in 1c being doubled; internal to this is a white bar slightly tinged with ochreous, passing through areas 1a to 3, and carried into 4, 5, 6, and 7 as orange marks. Internal to this whitish bar is one of black outlined with white, the mark in 4 being set more inward than the rest. The chestnut area of the wing carries black bars outlined with white, as follows: Cell with three, one basal, one at mid-point, one sub-apical; and one just beyond the cell; one each across the sub-bases of 1b and 2.

H.-w.: Ground colour chestnut, the distal part of which is traversed by a white bar which extends from just outside the mid-point to the inner margin above the anal angle; this bar is widest at the costa and gradually thins out until area 1b where it expands to the fold. The extreme margin is narrowly black with white between the veins. Internal to this is a wide marginal border widest at the upper angle, of pale ochreous-yellow, bounded on the inner side by angular marks of blue-grey, that in 2 heavily edged with black outwardly. The anal angle carries an ocellate spot ochre-yellow above olive-green below, with a central brown oval area outlined in black

A



B



Photo: Dr. van Someren

PLATE LXI.

Charaxes jasio epijasio.

Fig. 1. ♂ upperside. Fig. 2. ♂ underside.

bearing two bluish-white streaks. The upper part of the basal chestnut is ornamented with broad black marks outlined with white, as follows: Two in 8, one in 9, two in 7, one sub-basal in 6, three in the cell; in the lower part of the brown area a series of five almost parallel lines in areas 1a, 1b, 1c.

FEMALE:

Very similar to the male but the marginal ochreous border rather paler, and the blue area of the hind-wing more restricted.

EARLY STAGES. Pl. XLVII., figs. 5, 5a, 5b.

The eggs of this species are canary yellow when first laid and measure 1.25 mm. in diameter. They are almost spherical, the top being only slightly flattened and ornamented with shallow fluting. They are deposited on the leaves and stems of a species of *Sorghum* known to the Baganda as Mwemba, and to the Kavirondo as "Matama." The egg stage lasts seven to ten days.

The young larva proceeds to devour the egg-shell as soon as it has emerged, and in the first instar it is hardly to be distinguished from the young larva of *Ch. c. castor*. Growth is very rapid, and the colour changes from yellowish-olive to bright grass-green at the second moult.

Although in many ways this larva resembles that of *castor*, it can be recognised by its more emerald-green colour and finer papillation. The dorsal spots are quite distinct, occurring on the 6th and 8th segments; they are oval in outline and of a greyish colour, bordered with black. The hind spot is not always well defined and is frequently spindle-shaped. The lateral body-line is canary-yellow and extends from the second segment to the tail. The larva becomes full-fed between the fourteenth and eighteenth days. When ready to pupate the colour changes somewhat and the body becomes slightly translucent.

Pl. LXXVI., fig. 18.

The head resembles that of *castor*, but is less robust; it carries four long, pointed, pink-tipped horns, the inner pair being separated by two short spines, while a similar pair projects between each lateral and inner horn. A yellow line, edged with black, runs from the outer side of the lateral horns to the mouth-parts. The mandibles are black or dark brown. The pupa is somewhat like that of *pollux*, in that the lateral aspect of the abdominal segments is decorated with reddish spiracular spots. The distal edges of the wing-cases are outlined by a white streak. The head is thick-set and truncate. The pupal stage lasts 10 days to even four weeks according to temperature and humidity; emergence is delayed if the weather is cold and dry. The pupa is usually attached to the leaves of the food-plant and as the red spiracular spots are very like the red spots so frequently seen

on Matama leaves, and the general colour is similar, it is difficult to detect unless the leaf is viewed laterally.

DISTRIBUTION AND HABITS:

Ch. j. epijasius appears to have a somewhat restricted distribution; we have taken it in the northern districts of Uganda and east to Busoga, and in the Kavirondo country, but usually in the vicinity of native cultivations where *Sorghum* is grown. It is an insect of the open bush country and as it hangs around the Matama fields, seldom travelling very far therefrom, one can always count on seeing males and females in fair numbers, and in about equal proportions. The imago feeds on the juices which exude from the stems of *Sorghum* plants which have become infected with "borers," either coleopterous or heterocerous, larvæ.

This species is powerful and rapid in flight and very active; it is however easily captured when feeding on the fermenting juices which seem to intoxicate it.

MIMETIC ASSOCIATIONS:

Professor Poulton has put forward the suggestion that *Ch. j. epijasius* acts as the model for the smaller and less robust female forms of *Ch. etheocles* known as *viola* and *vansomereni*. There is an undoubted superficial resemblance which when the insects are in flight is greatly enhanced. The geographical distribution and association coincides and there is evidence to show that the resemblance is of service to the mimics.

Poulton quotes Col. Wilson who wrote of his experience of the two species in the Nuba Mountains of the Sudan: "The *viola* form of *etheocles* flies with *epijasius*, and is almost indistinguishable from it on the wing except for its smaller size. I was out with Capt. Kent-Lemon . . . when I took my first specimen of the former butterfly, and we both thought it was an *epijasius*, until it was netted. . . . We both took several *epijasius* round the same tree that day and later on several occasions took them together. The tree particularly favoured was *Albizzia amara*, Boirin. Neave wrote: "I only took the *viola* (*vansomereni*) form in the open country in Northern Uganda. It occurs on both sides of the Victoria Nile, but chiefly on the east. In that region apparently nothing but this form occurs, and it is more or less all open country. *Ch. j. epijasius* is common there"

CHARAXES PELIAS SATURNUS, Butlr. Pl. LXII., figs. 1 and 2.
Pl. LXIII., fig. 1.

FOOT NOTE.—For figures of female *etheocles*, see subsequent Journal.

A



B



Photo: Dr. van Someren.

PLATE LXII.

Charaxes pelias saturnus.

Fig. 1. a ♂ upperside. Fig. 2. b ♀ upperside.

Expanse: Male 84-90 mm., females 96-102 mm. General colour in both sexes orange-brown and black.

F.-w.: Male, ground-colour mostly black shading to rufescent-chestnut at the basal triangle. Cell with a black spot towards the upper part of the apex. Margin ornamented with a series of large orange spots, double in 1b, extending from this area up to the apex. The wing is traversed by a broad ala bar of orange-ochreous confluent marks which extend from the mid-area of 1a up to the sub-basal area of 4, then continued by three oblong spots set at an angle to the rest, in 5-7. Just external to this bar is a series of arrow-shaped orange-ochreous spots extending in an almost straight line from 2-7. In some specimens the ground colour is tinged with brown.

H.-w.: Basal triangle rufescent-brown, followed by a wide bar, widest at the costa and extending through the apex of the cell to the base of 3; pale ochreous at the costa and deepening to orange at the cell; the remainder of the wing blue-black, decorated at the extreme edge with white, and with a sub-marginal row of elongate spots extending from the anal angle to 7, olive green at the anal end, white in 2 and 3, and shading to orange-ochreous at the upper angle. Internal to these are four or five blue or purple-blue elongate marks, largest at the anal angle and decreasing in size up to area 4 or 5; the spot at the angle sometimes shaded centrally with pink. Vein 2 carries a long outwardly curved tail 10 mm. long; and vein 4 one of 7 mm. almost straight.

FEMALE:

The female resembles the male but is larger and paler and carries much longer tails; that on 2 being 14 mm. and on 4, 10 mm. long.

UNDERSIDE. Pl. LXIII, fig. I.

F.-w.: The basal area is chestnut-purple traversed with grey bars outlined first with black then white as follows: three cross the cell that in the middle being almost oval; a further bar crosses the apex of the cell; the outer margin of the basal area carries a series of similar marks from area 1b-7. Distal to this series is a wide white ala bar extending from the costa to the hind-margin, this bar is outwardly shaded with orange triangular marks, with near the bases of each a black circular spot, and at the apex a further series of black marks double and largest in 1b and extending to 8. The remainder of the wing is blue-grey decorated on the margin with triangular orange spots, bases inward, and double in 1b.

H.-w.: Ground colour purply-chestnut, traversed by a white ala bar widest at the costa and passing to just above the anal angle where it turns inward to the marginal fold. Distal to the chestnut area, the wing is proximally grey, deeply serrate and indenting the chestnut and almost touching the white bar; distally bordered by an orange sub-marginal line, which towards, and at the anal angle, is tinged with olive; this line is inwardly edged with black and distally touches the marginal black border, which is edged with white. The greyish zone is shaded with olive along the veins and in areas 1c-3 is almost entirely olive carrying purply-blue spots, double in 1b. The chestnut basal area is ornamented with grey bars outlined with black then white as follows: one in 9, two in 8, the outer continuous with a series which borders on the inner edge of the white ala bar to as far as the base of 2, one sub-basal in 6, two in the cell, these continuous with the outer two of the five longitudinal lines of 1a-1b.

EARLY STAGES:

Ch. p. saturnus lays its eggs on two species of trees belonging to the order *Leguminosæ*, *Azalia cuanzensis*, Welw., and a species of *Brachystegia*. The eggs are large, measuring 2 mm. in diameter, creamy or yellow in colour, slightly flattened on top and radially fluted. As with most *charaxes* eggs, signs of development are first apparent along the upper rim of the egg; this turns brown and within a week the entire egg becomes black. The young larva first feeds on the egg-shell and after resting for about 12 hours starts to feed on the leaves, young and old foliage being taken with equal avidity. They are voracious feeders, but eat mostly at night. During the day they lie up on some sheltered leaf which has been prepared by having an area, sufficiently large to accommodate the growing insect, spun over with silk. The young larva is at first yellowish-olive with a blackish-brown head carrying short tubercles; the body finely papillated, and the anal segment carrying two whitish tails. After the second moult the body becomes green with a slightly indicated body-line. The head is now green with well developed horns with brown tips, and a lateral facial line of the same colour. The dorsal spots are faintly indicated. The full grown larva measures 55 mm, is bright leaf-green in colour, with very fine papillaed surface and a yellowish body-line above which the spiracles appear as small blue spots, that on the first segment being the largest. The undersurface is yellowish-green, the true legs brownish, the suctorial ones pinkish at the edges. The dorsal spots are well developed and are present on the sixth and eighth segments; they are oval, set transverse to the segment and nearer the anterior edge; in colour brownish with a bluish centre and black outline.



Photo: Dr. van Someren.

PLATE LXIII.

Fig. 1. *Charaxes pelias saturnus*, underside.

Fig. 2. *Charaxes-castor*, underside.

The anal segment has two short tails. The head is intermediate in shape between that of *castor* and *epijasius*. It resembles the former in having a yellow outer margin, but the horns are more slender and the outer ones less incurved; whilst compared with the latter, the horns are not so divergent. The tips are reddish. The lower edge of the facial disc is rather square and the posterior aspect of the sides carry a series of well developed spines. The posterior aspect of the outer pair of horns is strongly spined; and both pairs are heavily papillated.

The pupa is large, averaging 28 mm, pale green in colour with white marbling on the thorax; white linear marks on the wing-scutæ; and a series of white dots along the line of the antennæ. The angle of the wings is indicated by a pinkish spot as are also the spiracles. The cremaster is well developed and consists of two lateral short pedicles each carrying two ventrically inclined knobs, and from between the pedicles a strong stalk with clawed end. Anterior to the pedicles on the ventral side are two kidney-shaped excrescences, pelves inward. The pupal stage lasts 12-20 days.

DISTRIBUTION AND HABITS:

Ch. p. saturnus extends from the coast region to the Mau where it intergrades with a form named by Miss Sharpe as *harrisoni*, type locality Kamagombo, S. Kavirondo. This race occupies the territory around Baringo to Suk and the Sotik, thence into Eastern Uganda, and appearing again S.E. of Mt. Ruwenzori. *Saturnus* is common at the Coast and the Teita-Taveta region. It is occasionally met with in the Nairobi area but being an insect which frequents the more open park-like country it does not occur at high altitudes. In the Forthall district and along the Tana it is common.

CHARAXES PELIAS HARRISONI. E. M. Sharpe, not figured.

This race, the distribution of which is given under *saturnus*, is characterised by the darkening of the brown to almost black; a marked paling and increase in size of the marginal spots and a considerable increase in the blue areas in the hind-wing.

This brings us to a consideration of the *Mimetic associations of the species*.

In the coastal districts *saturnus* is mimicked by the *rogersi* form of female *etheocles*, the female of *guderiana*, and that of *achæmenes*, with the female of *boueti* as an outlying member of the group. When we come to the race *harrisoni*, we find that it in turn is influenced by the presence of *Ch. j. epijasius*.

Foot note:—For a full description of this association, refer to Poulton International Entomological Congress, July, 1925, p. 527—532.

CHARAXES HANSALI BARINGANA, Rothsch, Pl. LXIV., fig. 1 &
2. Pl. LXV., fig. 1.

Expanse: Males 90-100 mm, females 100-110 mm. General colour of both sexes black with yellowish-white bar.

F.-w.: Male. Ground colour of wing brownish-black shading to olive at the basal third; apex of cell black with an olive spot. Margin of wing with a series of yellowish-white spots placed internervularly, double in 1b and extending to the apex; an ala bar of contiguous almost rectangular yellowish-cream spots crosses the wing from the mid-area in 1a to the sub-base of 4 and then at a slight angle in 5-7. In these areas, a series of three spots are present, the largest in 7, arranged parallel to the outer margin.

H.-w.: Basal area olive inclining to black at the costa; rest of wing black but separated from the basal triangle by a creamy-yellow bar continuous with that of the fore-wing, extending from the costa to the base of 2. Extreme edge of wing black with white scaling in inter-spaces; internal to this a series of crescentic spots, olive at the anal angle and gradually shading to creamy-yellow in 4-7; the anal angle with a double bluish spot, areas 2, 4 one each. Veins 2 and 4 carry tails, that on 2 being 10 mm. long, on 4, 7 mm.

FEMALE:

Very like the male but larger, and with paler and larger light spots and bars.

UNDERSIDE: Pl. LXV., fig. 1.

F.-w.: Cell and bases of 1b-3 and 5 and 6 chestnut distally bounded by black as far as the creamy-yellow ala bar. This bar is similar to that of the upperside; and is bordered on the distal side by a greyish ground colour to as far as the wing margin; the proximal side of this area bears a triple row of spots, a central row of chestnut spots bordered on either side by black ones, that in 1b being large, with the inner one in this area obsolete or entirely wanting. The margin of the wing bears alternate ochreous and black spots. The chestnut area at the base is traversed by broad olive-grey bars outlined in black then white as follows: One at base of cell, one circular spot at its midpoint, one at the distal end of the mid-third and one at the apex; one at the sub-base of 2 and one in 1b.

H.-w.: Basal area chestnut bordered by the creamy-white ala bar which is continuous with that in the fore-wing, and bending inwards towards the inner fold at 1b. Beyond the bar is a series of long triangular chestnut marks with black apices interdigitating with a series of olive triangular marks with black bases. This is followed by an ochreous marginal border, distally bounded by a narrow black edge

A



B



Photo: Dr. van Someren.

PLATE LXIV.

Charaxes hansali baringana.

Fig. 1. a ♂ upperside. Fig. 2. b ♀ upperside.



Photo: Dr. van Someren.

PLATE LXV.

Fig. 1. *Charaxes hansali baringana*, underside.

Fig. 2. *Charaxes brutus brutus*, underside.

with white between the veins. Areas 1c, 2—4 bear sub-marginal blue spots, double in the first and diminishing in size. Areas 9, 8 and 7 carry olive bars outlined with black and white, while the cell is traversed by three such bars. Areas 1a to c with five longitudinal blackish-olive lines.

EARLY STAGES: Unknown.

DISTRIBUTION AND HABITS:

This interesting species is found in the open park-like country of the Coast, Teita and Ukambani, and in similar type of country through the Northern Guasso Nyiro to Baringo. It has also been recorded from N. Uganda. It is apparently rather rare in collections but is no doubt not uncommon within its distribution.

MIMETIC ASSOCIATION:

As has already been noted, this species is associated with *Ch. brutus*, and would appear to be associated with the south-eastern form of *castor*. It probably acts as a model for the *aubyni* form of female *etheocles*, with which in life it associates.

CHARAXES CASTOR, Cram. Pl. LXVI., fig. 1 & 2. Pl. LXIII., fig. 2.

Expanse: Males 100-106, females 120-150mm. General colour of both sexes black with orange-yellow bar.

F.-w.: Ground colour blue-black, tinged with olive at the base. An orange-yellow bar starting at about the mid-point in 1a passes up the wing to the base of 4, the spots in 2 and 3 are rounded on the inner side and invaded on the outer by black, sometimes completely separating off part of the yellow. Beyond this bar is a series of six orange spots arranged in a V, with the apex in 4. The inter-spaces at the extreme margin are white-scaled.

H.-w. Blue-black with the base and the inner margin tinged with olive. The margin of the wing is serrate with white sealing between the veins. There is a sub-marginal series of linear spots, continuous and of a blue colour in 1b to 3, interrupted and shading to orange in 4—7. There is an additional series of blue spots double at the anal angle and extending to 4.

FEMALE:

Very like the male but larger, and yellow areas paler.

UNDERSIDE: Pl. LXIII., fig. 2:

F.-w.: Ground colour black with the outer edge olive-grey. The wing is crossed by a creamy bar suffused with orange scaling especially in areas 4-7. An orange bar runs alongside the whitish one to as far as area 5, when it continues parallel to the outer margin up to 7. This orange bar is bordered on either side with black spots,

those on the inner side smallest in 2 and gradually increasing in size up to 7; the outer series starts in 8 in increasing size up to 1b. The extreme edge of the wing is narrowly margined with black, while along the sub-marginal zone is a faint black line from the hand angle to the apex. The basal area is traversed by pairs of white lines as follows: one at the base of the cell, an oval towards its centre, a widely separated pair sub-apical, and at the apex a divergent pair. Distal to these is a widely separated pair crossing 5-7. The sub-basal area of 1b, 2,-4 each carries a pair set irregularly.

H.-w.: Basal area black, bounded by a white band widest at the costa and diminishing in breadth to vein 2 when it inclines inward to above the anal angle. This bar is bordered distally by a large chestnut area, in 2-7; this in turn is bounded by an olive-grey zone bearing triangular black marks, and in 2-4 rounded purply-blue spots distally edged with black. The anal angle carries a purply spot on an olive ground, surrounded by a yellow-orange zone; this last continuous with a submarginal border which extends along the margin of the wing up to 8. The edge of the wing is black, narrowly white between the ends of the veins. There is always a black spot on the outer side of the white bar, in area 4. The basal black is ornamented with parallel white lines as follows: one pair in 9, two in 8 and 7 one in 6. Three in the cell, and five in 1a-1c; these being joined at the ends and forming loops.

EARLY STAGES:

The egg of *Castor* is spherical, 2 mm. in diameter, pearly-yellow in colour and slightly cupped and fluted on the top. It is laid singly on the leaves of the food-plants, principally a *Sorghum* with the native name of Mwemba (Luganda) Matama, (Kiswahili) probably *Sorghum roxburghii* Stapf.; also on *Gymnosporia senegalensis* Loes. (*Celastraceæ*); a creeper, *Tragia cordifolia*, Vahl. (*Euphorbiaceæ*), and on Mbambakofi (Kiswahili) *Afzelia cuanzensis* Welw. (*Leguminosæ*). A brown ring appears round the depression as the germ develops, and the whole egg turns a dark-brown, then black just before the larva emerges. Pl. LXXIII., fig. 2. The larva emerges in from eight to ten days and at once devours the egg shell. It is at first olive-yellow, very finely papillated, and carries on the anal segment two blunt fleshy spines with ochreous papillæ. The head is black with short tubercles on the upper quadrant. It is a voracious feeder and is easily reared. It assumes a greener tint with each successive moult, and the dorsal spots appear at the third instar, whilst the degree of papillation is continually increased also. The adult larva (Pl. XLVII., fig 2, 2a.) is a most conspicuous object, as it is about 9 cm. long, with a grass-green body covered with coarse closely-set irrorations or papillæ. The tip of each papilla is light yellow in colour, giving to the larva



Photo: Dr. van Someren.

PLATE LXVI.

Fig. 1. ♂ *Charaxes castor*.

Fig. 2. ♀ *Charaxes castor*.

a speckled appearance and also showing off the papillæ as a series of vertical bands. The body-line is formed by a series of cream-coloured papillæ, forming a spiracular line extending from the second segment to the tail. Most larvæ have two dorsal spots, although some only possess one.

They are placed on the sixth, and eighth segments, and each forms a conspicuous black oval, set nearer to the front of a smooth green oval area having its long axis parallel with that of the body.

The number of these spots bears no relation, to sex or to any other characteristic, so far as has been observed. (Pl. XLVII., fig. 2a). The head of the adult larva has the form of a hexagonal plate (Pl. LXXXVI., fig. 1) with its two lower sides elongated. The disc which bears fine dark-green papillæ, is divided by a vertical central groove, expanding into a smooth green area above the mouth-parts. Two stout side horns arise as the prolongation of the angle between the two lateral sides of the hexagon, and thus are set outwards, but afterwards curve slightly inwards, especially at the tips.

Each horn is six mm long, very serrated and coloured dark maroon on the inner aspect. From the upper angles of the plate arise two similar finely serrated horns, with their tips a deep maroon or red colour, slightly curving inwards. (Length 5mm.) A yellow face-line starts from the tips of the lateral horns and runs downwards along the outer aspect of the face to the mouth-parts; it is bordered along the outer and lower edge by a conspicuous black line which starts from the base of the lateral horns and reaches the mouth. This larva is one of the most striking in the group.

The pupa is large, Pl. XLVII., fig. 2b., of the usual *charaxes* form, and opaque light-green in colour; it is almost immaculate when the larval skin has just been shed but on the second day certain characteristic white patches appear on the wing-scuta and also on the dorsum of the thorax.

The whole transformation from egg to imago can be completed in six weeks, as the larva is a most voracious feeder and growth is extremely rapid.

DISTRIBUTION AND HABITS:

The habitat of *castor* is governed by the distribution of its food-plant, but as it has a more than usual range of food it is not surprising to find it occupying types of country quite dissimilar. Thus in the Jinja districts one finds it in the open cultivated areas where the Sorghum is grown; at the same time one sees them on the outskirts of forests, or even in the forest; along the coast and at Teita they frequent the more open type of park-country. It occurs from the Coastal belt through Kenya and throughout Uganda but we have no records of it having been taken in the Highlands over 6000 ft.

Females are usually taken near their food-plant but males are readily trapped in the open along forest paths and roads, with any kind of animal or fowl-droppings. Leopard excreta and fish entrails form a most attractive bait to most male *Charaxes*.

This species is one of the largest of the group, is plentiful where it occurs, is a conspicuous insect and very powerful.

MIMETIC ASSOCIATIONS: In Uganda where the species is very plentiful it would appear to have undoubtedly influenced the colouration of one female form of *Ch. etespie*, recently described by Prof. Poulton as *castoroides*. In this form the ala bars are orange-ochreous as in the model. When we compare the insect as it occurs in the southern and eastern portion of Kenya we find it rather paler than the typical form and flying in association with *Ch. hansali baringana*; there would thus appear to be a mutual modification of colour to a common tone.

CHARAXES CASTOR FLAVIFASCIATUS. Butlr. Pl. LXVII., fig. 2.

The form of *castor* found south of Nairobi, especially in the Teita country and the Coastal zone is sufficiently distinct to require recognition. The main points of difference are: The general ground colour is not so black, more tinged with olive; the fore and hind wing bar is not orange but ochreous as are also the sub-apical series of spots and the upper submarginal lines in the hind-wing. The under-surface is also much paler. It therefore is very like *Ch. hansali baringana* in general type of colouration, and indeed is always in close association with that species.

CHARAXES POLLUX POLLUX. Cram. Pl. LXVIII., figs. 1 & 2.
Pl. LXIV., fig. 1.

Expanse: Males, 80-90 mm; females, 90-100 mm. General colour of both sexes, orange-yellow with black border.

F.-w.: Basal third of wing orange-brown bordered distally by a wide orange-yellow bar not very sharply defined proximally, extending from the mid area in 1a and gradually lessening in width and represented as spots in 6 and 7; the outer margin conforming to the contour of the wing. Beyond this bar the wing is black with a slight brown tinge, bearing on its margin small orange-brown spots at the mid-point in each area; there is a double spot in 1b. There is a black spot at the apex of the cell, one just beyond, followed by two large marks below the costa and one at the base of 3.

H.-w.: Basal area light orange-brown bordered by an orange bar, palest in 6-8, and not reaching the inner marginal fold. Rest of wing brown-black with a blue spot at the anal angle and often an orange spot in 7. The margin of the wing is strongly serrate. Each vein carrying tails, that on 2 being as long as that on 4 (7 mm).



Photo: Dr. van Someren.

PLATE LXVIII.

Charaxes pollux pollux.

Fig. 1. ♂ upperside. Fig. 2. ♀ upperside.

FEMALE:

Resembles the male but is larger and with the markings wider.

UNDERSIDE: Pl. LXIV., fig. 1.

Ground colour reddish-chestnut; the bar ρ of above is present below, but is creamy, distally bordered by orange scaling; this border carries on its distal edge triangular black marks, bases inward, double in 1b, all except the last mentioned outlined with silvery-grey, the apices of all reaching the marginal border which is ochreous-brown with black marks at the end ρ of each vein. The basal chestnut area is ornamented with black lines broadly bordered with silvery-white and arranged as follows: Three set equidistant and transverse in the cell, with one at its apex; one crossing the sub-bases of 4-7, with a series set at an angle to them and forming a V; one at sub-base ρ of 3; a double one towards the base of 2; and a large black mark in 1b.

H.-w.: Basal area reddish-chestnut bordered distally by a narrow silvery-creamy bar corresponding to the inner part of the bar on the upperside. Remainder of the wing ochreous-brown, with an olive tinge towards the anal angle, and with an orange tinge proximally in 5-7. This area carries a series of chestnut-red marks outlined proximally and distally with black crescentic or trident marks, edged with white, with a few silvery white scales scattered over the chestnut. The spot at the anal angle is ocellate consisting of a lustre olive-brown ground surrounded with black and bearing in the centre two purply-blue spots. The extreme margin of the wing is black, with white edging between the veins and small silvery streaks indicating the tips of the veins.

The basal area carries black marks outlined with silvery-white as follows: One in 9; two confluent in 8; two in 7; one each, very small in 4-6; one sub-basal and one apical in the cell; while 1c has two cross bars connected by a longitudinal line; and 1a and 1b, three looped lines.

EARLY STAGES:

The eggs are laid on the young leaves of two food-plants—a species of *Sorindeia* (*Anacardiaceæ*), known to the Baganda as "Muziru"; also on *Bersama abyssinica*, Fresen. (*Melianthaceæ*).

The eggs are laid with great rapidity, so much so that the insect will not even trouble to shift the position of the ovipositor, with the result that very often two or more eggs are piled one on top of another. They are of the usual *Charaxes* form, a sphere with a saucer-like fluted depression on the top, pearly white in colour and 1mm in diameter. At an early stage of development, three radiating lines appear on the surface giving the egg a marbled appearance. When the egg is mature it turns dark-brown to black.

The young larva (Pl. LXXIII., fig. 3) hatches in from seven to ten days and at once eats the egg-shell, then after a while commences on the young shoots and descending as it grows consumes the more mature leaves. Very shortly after emerging it spins a pad of silk on some sheltered leaf and returns to this spot every morning after its nightly feed. The shelter is changed from time to time as the larva grows. The larva is at first uniform pale olive with a black head; the colour then changes with each successive moult to a translucent green which is almost smooth and immaculate until after the third moult, when one or two dorsal spots appear on the sixth and eighth segments respectively. The adult larva (Pl. LXXVIII., fig. 3 and 3a) is about 6 cm. in length, has a bright-green almost smooth-skinned body, the papillation being very fine, with one or two circular rusty-red spots on a white ground, enclosed by a fine brown line. In some larvæ the rusty-red tint later changes to a bright blood-red. When only one spot appears it is invariably on the sixth segment, the second if present being on the eighth. There is no definite body-line and the spiracles are obscure; the under-surface is greyish-white. When at rest the larva lies along the mid-rib of the prepared leaf, with its head and tail raised. As a rule one finds only a single larva to each leaf.

Pl. LXVIII., fig. 3a. Pl. LXXVI., fig. 7: The head is characteristic of the species, being in front view somewhat quadrate in outline and having two pairs of very spiny horns—a central, straight pair arising on either side of the mid-line, the lateral pair arising from just below the upper angles and curving slightly backwards and inwards. There are two short sharp-pointed spines between the central pair and one on either side of the lateral horns. The general colour of the head is a uniform bluish-green. No facial line is present, but the lateral tubercles and the spines on the horns are strongly developed. The larval stage lasts eighteen days.

The pupa is of the usual *charaxes* shape, smooth and with a light-green colour on the thorax and wing-cases becoming more bluish-white towards the dorsum of the abdominal segments. There is only a slight concavity between the thorax and the abdomen on the dorsum; practically no projection of the shoulders of the wing-scutae but the head is bifid. There are white patches on each wing-case, while the abdominal spiracles are represented by a row of six reddish-brown spots. The pupal period extends to ten days as a rule but is often longer.

DISTRIBUTION AND HABITS:

This species occurs throughout Uganda and Kenya in the typical form to about the region of Nairobi; south of this it intergrades with the eastern and southern form *geminus*. It would appear to have a preference for the more open park-like country rather than the forest.



Photo: Dr. van Someren.

PLATE LXIX.

- Fig. 1. ♂ *Charaxes pollux pollux*, underside.
Fig. 2. *Charaxes pollux geminus*, upperside.

but when found in the latter, is usually on the outskirts. Although a common species it is more frequently captured when feeding on droppings, or when sucking the exudate from a wounded tree. This exudate when fermented renders the insect intoxicated and easy to capture by hand. As with most *charaxes*, males are more in evidence than females, these latter being more retiring in their habits. The species would appear to have no definite or limited breeding-season, as fresh eggs and larvæ in all stages are found throughout the year.

MIMETIC ASSOCIATIONS:

Although a common species with a very distinctive type of colouration, this insect does not seem to bear any close resemblance to any other in the group or other genus.

CHARAXES POLLUX GEMINUS. Rothsch. Pl. LXIV., fig. 2.

This race differs from *pollux pollux* in having the orange bar of both fore and hind-wings wider and paler, and in the marginal spots of the fore-wings being larger while those in the hind-wing are present as submarginal streaks extending from 2-7.

UNDERSIDE:

As in the typical form but the marginal orange-ochreous border, is wider.

EARLY STAGES:

As for the parent races.

DISTRIBUTION:

This race occurs along the Coastal belt through the Teita country to Kilimanjaro, and through the thorn-bush country in Ukambani to the Northern Guasso Nyiro; in the higher altitudes it grades rapidly into the parent form. In habits it is not dissimilar.

CHARAXES BRUTUS BRUTUS, Cram. Pl. LXX., figs. 1 and 2. Pl. LXV., fig. 2:

Expanse: Males 62-90 mm.; females 98-104 mm. General colour of both sexes black with a white ala bar.

F.-w.: Male. Ground colour black with a marked bottle-green sheen at the basal triangle. It is crossed by a pronounced creamy-white ala bar running from the hind margin just out of the mid-point, first with contiguous spots then detached and diminishing in size up to the mid-point in 7. The hind-wing has a similar ground colour but the white bar is broadest at the costa and gradually narrowing to 1c and not reaching the inner margin. This bar is often narrowly bordered with greenish scaling. The margin is strongly serrate and between the projections the edge is white. Veins 2 and 4 carry tails, sharply pointed, 5 and 7 mm. in length. The male figured has no sub-marginal

ornamentation except that the anal angle carries two purple-white spots; many specimens however have purple dots in 2-4, and slight white lines running up the tips of the veins. This latter is characteristic of the southern race, *natalensis*.

UNDERSIDE: Pl. LXV., fig. 2:

F.-w.: The white bar is represented on the under-surface but the spots are contiguous; internal to the bar the ground colour of the wing is reddish-chestnut, distally it is orange-brown. This latter is ornamented with triangular black marks in each area, double in 1b, each mark outlined with silvery-grey; the veins are scaled with this colour, and at their extreme ends there is a blackish mark. The basal area carries the following greyish bars outlined in black and then white: one quadrate at the base of the cell, one ovoid at about the middle, one oblong sub-apical, followed by an oblong at the apex; a long confluent oblong crossing 5-7; one ovoid at sub-base of 3, two ovoid in 2; one double-ended long line in 1b.

H.-w.: Basally reddish-chestnut bordered by the white bar as above, but continuous to the inner margin just above the anal angle. The ground colour of the remainder of the wing to the margin is ochreous-brown; with, in areas 3-7 a chestnut zone outlined distally with silvery-grey and black and carrying on its inner border black trident-like marks with silvery-grey outline, the central projection extending into the brown area. The anal angle and the sub-marginal end of 2 are ornamented with ocellate marks outwardly black, with two and one purple spot on an olive-brown ground. The chestnut basal area is crossed by silvery-grey marks outlined with black then silvery-white as follows: one in 9, two in 8 and 7, one small dot in 6 and 5, three in the cell, one in 4. Areas 1a-1c with four looped lines, that in 1c bifid towards the base.

FEMALE: Pl. LXX., fig. 2:

The female resembles the male, but is larger, with more pronounced marginal spots and wider ala bars.

EARLY STAGES: Pl. LXXII., fig. 2.

We have observed this species laying on several food-plants of widely different appearance, and to us at least different smell and taste. In Uganda, it lays on a tree with broad lanceolate leaves, known to the Baganda as "Kiujamata"; on a species of *Grewia* (*Tiliaceae*) "Lukandwa" in Luganda. At the Coast it lays on a tree named by the natives of Rabai, "Munyamazi."

A point of interest is that this *Charaxes* has taken to laying its eggs on the leaves of an imported plant commonly known as the Cape Lilac, *Melia azedarach* Linn. *Meliaceae*. Both in Kenya and Uganda has this been observed, but we have never been able to rear young



Photo: Dr. van Someren.

PLATE LXX.

Charaxes brutus brutus.

Fig 1. ♂ upperside. Fig. 2. ♀ upperside.

larvæ on this plant at any time, nor taken a wild larva on it. Platt however, in his *Food-plants of African Lepidopterous Larvæ*, mentions this tree as one of the foods of the species, but whether or not this statement is based on successful rearing of the insect on it, or the finding of full grown larvæ thereon, we are unable to say.

The eggs are pearly white, and 2 mm. in diameter. It is of the usual spherical form, but the cupped fluting is not marked at all; development first shows at the rim as a brown mark which spreads to the entire surface, becoming dark-brown when mature. The egg hatches in eight to twelve days. The young larva (Pl. LXXIII., fig. 6) is at first dull olive-brown, with a black head, but changes to greenish at the first moult. The head is shed, but the cast skin is frequently eaten. In captivity these larvæ appear fastidious feeders and unless the food is of a suitable degree of freshness, they refuse to eat, with resulting high mortality. The mature larva (Pl. XLVII., fig. 1, & 1a) is 55 mm. long; body dark emerald-green with fine papillæ over the dorsum and lateral surfaces. There is no body-line but just above the very light green of the underparts there is on each segment a faint-shaped mark. In the young larva, after the third moult, the dorsal spot appears as a white dot; as the larva matures this is variable; sometimes oval and reddish-brown on a light-grey ground, sharply marked off from the body colour by a fine brown line: sometimes a bright red oval on a dull-green area; or it may be represented by a grey heart-shaped area with its point directed backwards and having a crimson centre.

Pl. LXXVI., fig. 8. Pl. XLVII., fig. 1a.

The head is somewhat oblong, square-cut at the mouth, with these parts shewing up clearly as jet black. The head has a distinctive bluish tinge and is divided vertically by a central groove and is covered with fine papillæ. Two somewhat thick horns, 4mm, arise from the lateral aspect of the upper third of the face, curve upwards and slightly outwards, while the two 3 mm., inner ones, project from the upperside and curve slightly backwards. All are finely papillated.

Between the central pair of horns are two spinous processes, and one between each central and lateral horn.

There is a yellow line which, starting from the base of the outer horns, extends round the edge of the face and meets over the mouth-parts.

The pupa is very much like that of *pollux*, pale green in colour with a row of six red spiracular abdominal spots. The keeling on the margin of the wing cases and on the thorax is more marked, and the whitish marbling on these two areas is more restricted. The imago emerges in fourteen days.

DISTRIBUTION AND HABITS:

This species ranges over the greater part of Uganda and Kenya, though nowhere is it quite like the parental form; even in Uganda, the fore-wing bar is wider and not pure white as in true *brutus*; then when we compare the specimens from Kilimanjaro area and the Coast we find they are much nearer to the Southern form *natalensis*. It is a species which frequents forest and park-like country, is very plentiful and easily baited. Nearly every collection of leopard-droppings on a roadside near a forest will have one or more specimens of this species feeding on it. The females are attracted by fermenting fruit juices and exudates from trees. When the females are ovipositing, they do so very rapidly, as we have counted four eggs laid in quick succession within five minutes, but not all on one leaf.

MIMETIC ASSOCIATIONS:

The marked colouration of this species seems to have had an influence on several species of *Charaxes*, and possibly other *Nymphalids* and *Papilios*. Amongst the *Charaxes* we find that the *ethocles* form of female *ethocles*, and the *ethalion* form of *ethalion*, the female of *ansorgei*, the black and white female form of *etesipe*, both sexes of *hansali baringana*, the female of *Ch. baumanni*, and others to a less marked degree, all possess a colouration remarkably similar and a distribution which coincides with this very powerful species.

Amongst other *Nymphalids* one finds certain species of that strong association of *Neptis*, and *Eurytela hiarbas*; and the *Zenobia* group of *Popilios* bearing a marked resemblance to *Ch. brutus* in its several geographical forms.*

CHARAXES BRUTUS NATALENSIS. Stgr. Not figured.

Expanse: Slightly larger than *brutus brutus*, with a wider and more creamy-yellowish bar especially in 1a and 1b; with distinct marginal ochreous spots in the mid-internervular spaces; and with a sub-marginal row of double triangular spots directed towards the tips of each vein up to 7.

The colour and distribution of marks on the underside is as in the typical form, but the markings are slightly larger.

FEMALE:

Follows the general description of that of *brutus*, but the pale markings on the upperside are more pronounced and larger.

EARLY STAGES:

As in the type form.

* FOOT NOTE.—For a full account, see Poulton op. cit.

DISTRIBUTION :

This form is found from the Coast to Kilimanjaro and inland to the Highlands where it intergrades with the western form.

MIMETIC ASSOCIATIONS :

See notes under *brutus*.

CHARAXES ANSORGEI. Rothsch. Pl. LXXI., fig. 1—3.

Expanse: Males 80-86, females 86-100 mm. Sexes unlike. General colour of male brown and black with a white bar, in hind-wing. General colour of female brown and black with white bar in both wings.

F.-w.: Male. Basal third rich reddish-chestnut, remainder brownish-black. An orange bar shaded distally with rufous-brown with black spots in each area extends from the mid-area of 1a to 3, and is then continued to the costa as four small spots which follow the contour of the wing. Two other spots set at an angle to these four, in 5 and 6, form a V. The bases of 4, 5 and 6, the middle of area 7, each carry a linear orange mark. The cell has a black spot towards the upper part of the apex, and another one at the apex. The margin of the wing is ornamented with orange spots, double in 1b, set at the mid-point between the veins.

H.-w.: Extreme base brownish-grey, with the inner fold of the wing covered in long greyish hair-like scales; mid-area with a large bluish-white patch more bluish along the outer margin with slight purple scaling towards the costa, and with a white central line; rest of the wing to the margin, black, with a submarginal row of orange spots, small in 2 and increasing in size up to 7. The anal angle with two bluish spots frequently underlined with olive.

FEMALE: Pl. LXXI., fig. 1:

Forewing pattern very much as in the male, but the ala bar is white in 1a and 1b, yellowish in 2 and 3 and with an invasion of the ground colour into the spots in these areas cutting off the distal portions which remain as detached orange spots and are continuous with the four smaller spots which run up to the costa. The ground colour at the base of the wing is dull, deep chestnut, while that of the rest of the wing is brownish-black with a strong ochreous suffusion. The hind-wing is much as in the male but with considerable increase in the submarginal spots which are here dull ochreous-orange.

UNDERSIDE: Both sexes. Pl. LXXI., fig. 3:

Cell, bases of 2-7, reddish-chestnut; base of wing blackish; a white bar borders the basal brown, extending from 1a-5; this is bordered distally by a series of black marks, double in 1b, arranged parallel to the contour of the wing, and reaching 7; adjacent to these spots is a series

of orange triangles, bases inwards, following a similar contour; the ground colour to the edge of the wing is ochreous-brown carrying black triangular marks bases inward, and outwardly edged with silvery-white; the ends of the veins carrying diffuse black spots with in between them orange streaks. The base of the wing is crossed by black lines widely bordered with silvery-white, as follows: Three cross the cell and two its apex; a broad bar passes across areas 5-7 just about their mid-point; a curved lined sub-basal in 3; and two in 2; an anchor-shaped mark is present in 1b.

H.-w.: Basal area reddish-chestnut, bordered by a narrow central bar of silvery-white, widest at the costa and at the inner margin. Distal to this, the ground colour is olive-brown shaded with brown at the costal end and bearing a row of large black spots edged with silvery-white; in 1c and 2 the black marks are semicircular and form with submarginal black lines ocellate spots with bluish dots at the distal side. Between the submarginal black lines and the black marginal border there is an olive-orange zone.

The basal triangle is marked very much as in *pollux*, but the lines are wider. There is one in 9, two in 8, forming an inverted V, two in 7, one each in 6-3, the cell with one at the base and two near the apex in contact above; and areas 1a-1c carry 4 longitudinal looped lines.

EARLY STAGES: Pl. LXXV., figs. 4 & 5:

The egg is smooth and spherical, with a slight concavity on top. Numerous fine furrows radiate to the margin of the disc from a central point where they are coalescent. When freshly laid the egg is pale yellow or creamy, changing to pinkish-brown with the upper third purple-brown. They are deposited either on the upper or lower surfaces, principally the latter, of the young or old leaves of *Bersama abyssinica* Fresen. (*Melanthaceæ*). This tree is usually quite short, and when a sapling carries all its leaves at the top. It occasionally reaches to 40 ft. It is common in the more open parts of the Highland forests from Kikuyu to Mau and on Elgon; this distribution coinciding with that of *Ch. ansorgei*. The leaves are coarse, pointed and slightly serrate, six to eight pairs of leaflets form the leaf-spray. The flowers grow on a long spike and are white or pinkish. The ripe seeds are pubescent and red in colour. The Kikuyu name is *Musandi*.

We have watched *Ch. ansorgei* ovipositing on many occasions; a certain amount of discretion seems to be exercised in the matter of selection of suitable leaves. The insect will settle for a moment and pass her ovipositor over the surface of a leaf but will not always deposit her egg; she may do this to a dozen leaves before she selects one which appears suitable. We have noted that several plants may



Photo by Dr. van Someren.

PLATE LXXI.

- Charaxes ansorgei*.
Fig. 1. ♀ upperside. Fig. 2. ♂ upperside.
Fig. 3. ♂ underside.
Fig. 4. Pupa.

be tested and passed over and eventually one deemed suitable, on this as many as 8 eggs will be deposited.

The young larva emerges in about ten days and is at first a dingy yellowish colour, turning in 48 hours to apple-green. The first meal is made off the egg-shell. The head which is blackish bears on the top, divergent inwardly curving horns in the plane of the face, and a minute pair between the inner horns. The anal segment carries two horn-like processes of about the same length as the head-horns. They are divergent then curve inwards.

The surface of the head has a few pale tubercles. The horns are bluntly spiny with whitish tubercles, each bearing a minute pale hair on the tip. A few hairs are scattered over the body. Length on hatching 3mm.; before first moult 7 mm. When ready for the first moult the new head is visible under the skin of the first segment as a circular pinkish-brown patch. The colour of the larva in the second stage is very similar to that of the first, but the body is covered with numerous small hair-bearing pale tubercles and each segment shows a fine lateral oblique line of white papillæ, slanting from above forwards. There is a white spiracular line dividing the green of the dorsum from the pale whitish-green of the under surface.

A pair of white dorsal spots is present on each segment; length before second moult 12mm. In the third stage the upper half of the head is maroon with the horns brown while the lower half is yellowish-green with a few pale tubercles. The maroon colour is frequently retained up to the time of pupating; occasionally it disappears after the final moult. The colour of the body remains as in the second stage with the addition of a dorsal spot, roundish in outline bordered with a black line on the sixth segment. The spot is more pronounced in some individuals than in others. In a position of rest, the head and the first three segments as also the terminal ones are raised above the surface of the leaf.

In the fourth and fifth stages there is little difference. The body is pea-green, thickly covered with yellow papillæ. The oblique lateral lines are pronounced. The subspiracular line which is whitish is carried round the anal spines, becoming yellowish in this region. The almost circular spot on the dorsum of the sixth segment is brownish surrounded by a paler area and outlined in black and very often a second spot appears on the eighth segment.

The anal processes are short, broad, pointed and flattened horizontally. Length 53 mm. The larval stage lasts three to four weeks.

When the larva has curled prior to pupating, it loses most of its spots and becomes translucent.

The head of the mature larva (Pl. LXXXVI., fig. 11-13) is pale green with a large purplish patch over the upper half of the face, and the tips of the horns are violet-blue. The length of the horns in comparison with the size of the head is relatively shorter at this stage than previously. The whole of the head is coarsely punctate with scattered whitish tubercles and covered with rather long silvery pubescence.

The pupa is stout, widest at the third abdominal segment, thence tapering abruptly to the cremaster; anteriorly it narrows slightly to the fore end of the wing-case and then more abruptly to the front extremity, where it terminates in a slightly indented emarginate ridge. The ventral surface of the thorax is straight; the dorsal strongly convex. A lateral ridge on each side of the thorax starting from the head projections, and extending along the wing cases, ends at the front of the abdomen, where it becomes obsolescent. The base of the cremaster is transversely bilobed, and two excrescences are placed anteriorly to it on the ventral surface. The colour is a light-green with chalky pink marks on the points of the head-cover, also irregularly placed along the lateral ridges and scattered on the under surface of the thorax. The spiracles appear as dark-brown spots on a chalky-pink base. On either side of the proboscis is a conspicuous round white spots. The cremaster and adjacent excrescences are yellowish. Length 25 mm.; breadth 11 mm. The complete metamorphosis extends over ten weeks. The imago emerges in 16 days.

DISTRIBUTION AND HABITS:

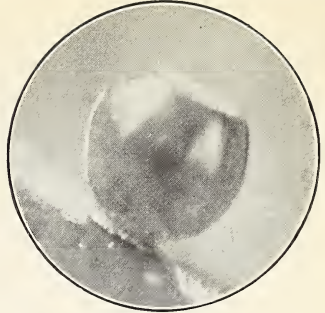
The distribution of this species as has already been indicated, coincides with that of the food-plant. It has always been considered a rare species but we have now bred it through in large numbers, and are able to obtain specimens from its known haunts. The southern limits of its distribution appear to be the Kikuyu Scarp from whence it extends through the Aberdares, across the Mau to Nandi and Elgon. We have no records of the species in Uganda, except in the South-west districts. This distribution is curious and worth noting.

It is a forest species which is met with in the more open parts and along the forest fringes. The males are fond of sunning themselves, with wings slightly open or with the hind-wings partly depressed, while the upper ones are kept in contact.

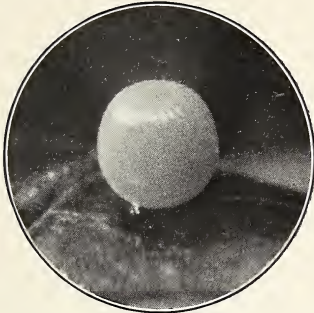
They come to bait but not as readily as some species. One usually finds the female somewhere near the food-plant and when she is intent on laying is not difficult to capture.



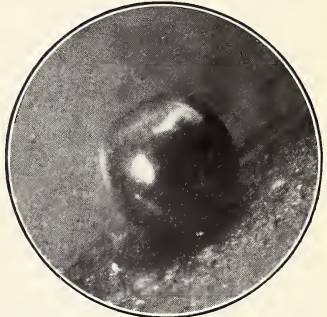
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4. cithaeron.



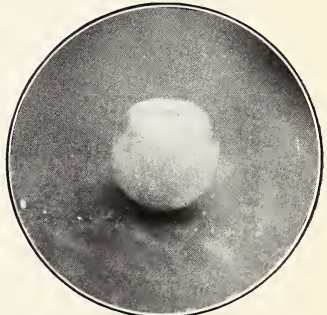
2. brutus.



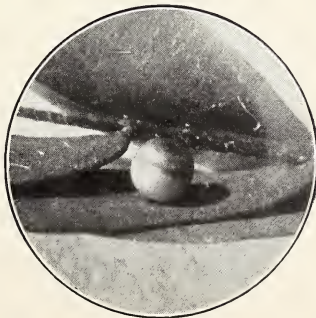
5. candiope.



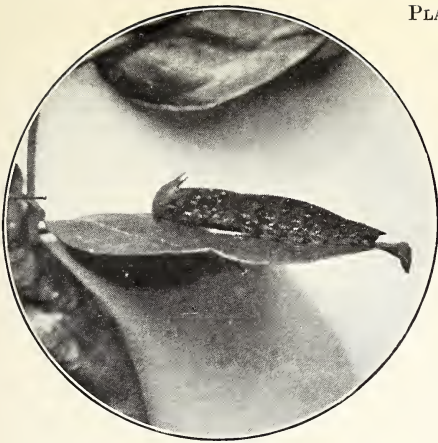
3. anticlea.



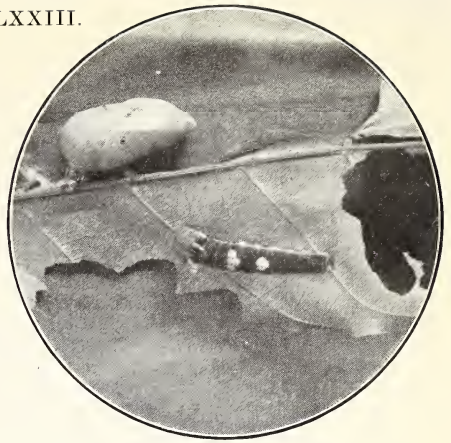
6. etheocles.



7. baumanni.



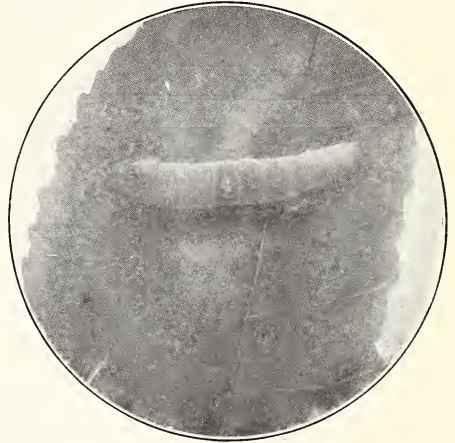
1. numenes.



4. tiridates.



2. castor.



5. etesipe.



3. pollux.



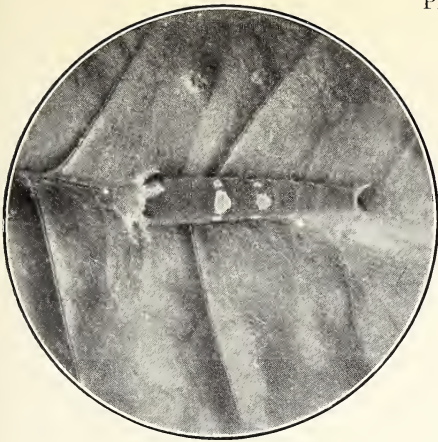
6. brutus.

V. G. L. van Semeren, photo.

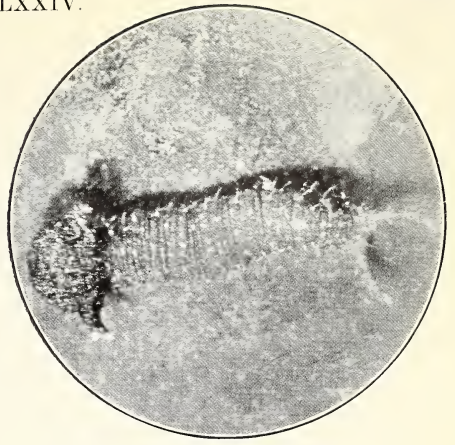
Vaus & Crampton, Ltd.

LARVAE OF CHARAXES.

Figs. 1, 2, 4, 5, half natural size, 3 and 6 greatly enlarged.



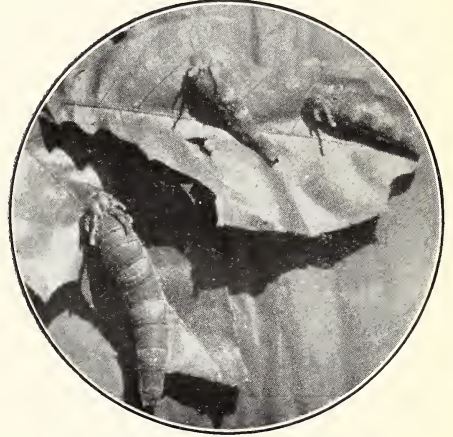
1. *C. candiope*.



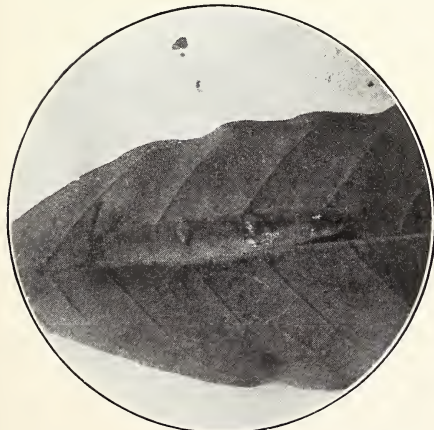
4. *C. candiope* (newly hatched).



2. *C. baumanni*.



5. *C. fulvescens* monitor.



3. *E. ansellica*.



6. *C. varanes*.

V. G. L. van Someren, photo.

Vaus & Crampton, Ltd.

LARVAE OF EUXANTHE (Fig. 3) AND CHARAXES.

Figs. 1, 3, 5, 6 about three-quarters natural size, 2 about half, 4 greatly enlarged.

1.
Palla
ussheri



2.
Palla
ussheri.



3. *Ch. fulvescens.*



4. *Ch. ansorgei.*



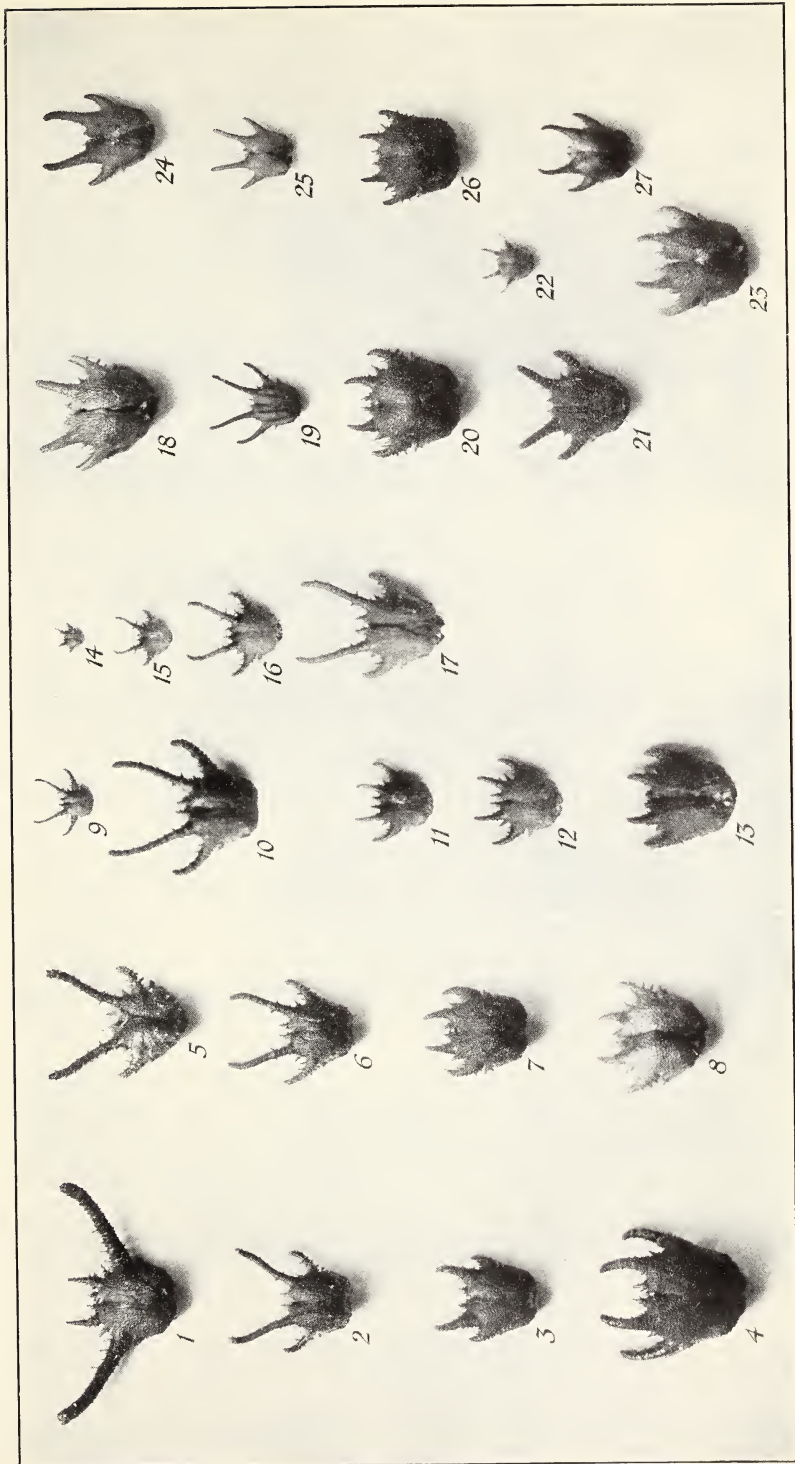
5. *Ch. ansorgei.*

V. G. L. van Someren, photo.

Vaus & Crampton, Ltd.

LARVAE OF PALLA AND CHARAXES.

All figures natural size except figure 3 (about three-quarters).



Vaus & Crampton, Ltd.

CAST HEADS OF EUXANTHE (Fig. 1) AND CHARAXES.

Figures 1-8 natural size, all others slightly enlarged.

V. G. L. van Someren, photo.

EXPLANATION OF PLATES LXXII—LXXVI.

PLATE LXXII.

Eggs of *Charaxes*.

- Fig. 1. Egg of *Charaxes varanes* (Nairobi).
2. " " *brutus brutus* (Nairobi).
3. " " *anticlea adusta* (Jinja).
4. " " *cithaeron* (Nairobi).
5. " " *candiope candiope* (Nairobi).
6. " " *etheocles etheocles* (Nairobi).
7. " " *baumanni* (Nairobi).

PLATE LXXIII.

Larvae of *Charaxes*.

- Fig. 1. Larva of *Charaxes numenes numenes* (Jinja).
2. " " *catsor castor* (Jinja).
3. " " *pollux pollux*, newly hatched (Nairobi).
4. " " *tiridates tiridates* (Jinja).
5. " " *etesipe etesipe* (Jinja).
6. " " *brutus brutus*, newly hatched (Nairobi).

PLATE LXXIV.

Larvae of *Charaxes* and *Euxanthe*.

- Fig. 1. Larva of *Charaxes candiope candiope* (Nairobi).
2. " " *baumanni* (Nairobi).
3. " *Euxanthe ansellica* (Jinja).
4. " *Charaxes candiope candiope*, newly hatched (Nairobi).
5. " " *fulvescens monitor* (Jinja).
6. " " *varanes vologeses* (Jinja).

PLATE LXXV.

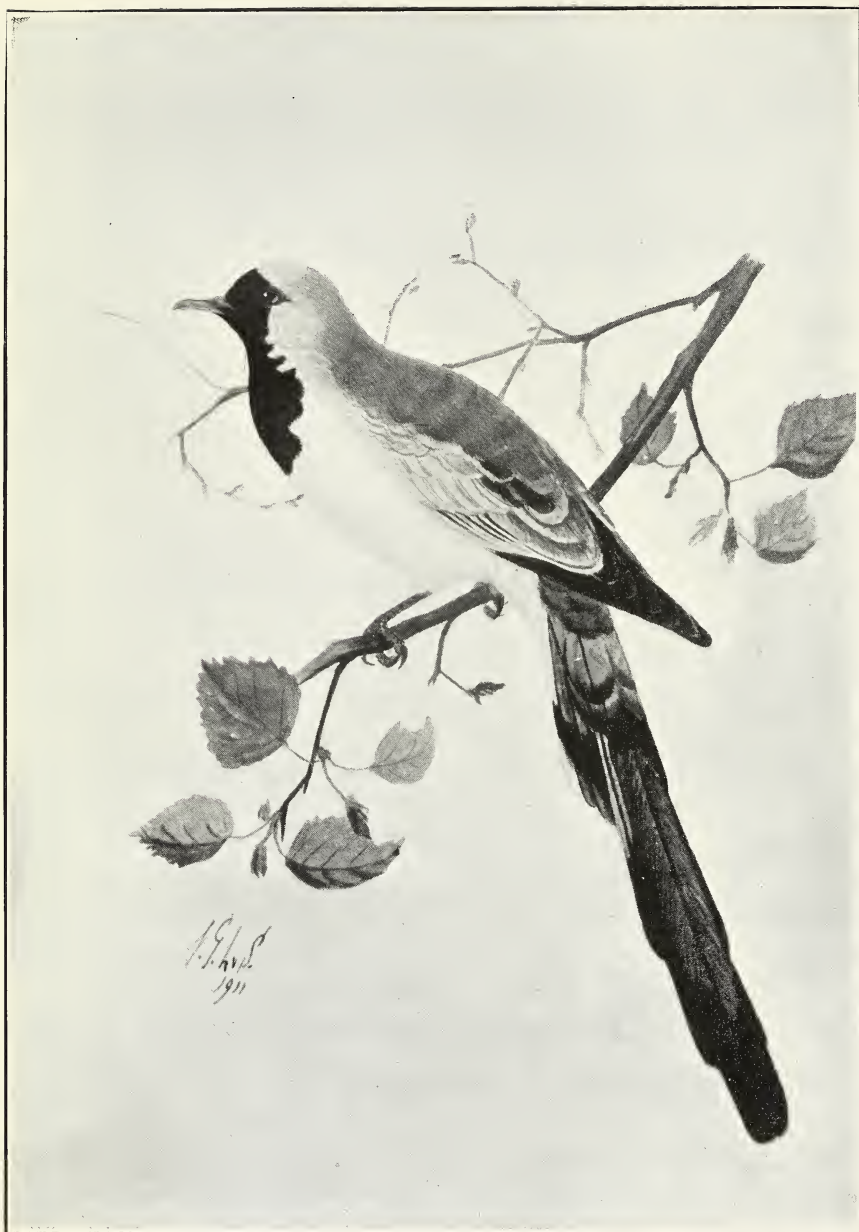
Larvae of *Palla* and *Charaxes*.

- Figs. 1 & 2. Larva of *Palla ussheri interposita* (Jinja).
3. " *Charaxes fulvescens* ? *acuminatus* (Kikuyu Escarpment).
4. " *Charaxes ansorgei*—red-spotted variety—above, and ochreous-spotted variety—below (Kikuyu Escarpment).
5. " *Charaxes ansorgei*—white-spotted variety (Kikuyu Escarpment).

PLATE LXXXVI.

Cast heads of *Charaxes* and *Euxanthe* larvae.

| | |
|---------|---|
| Fig. 1. | Cast head of <i>Euxanthe ansellica</i> (Jinja). |
| 2. | " " <i>Charaxes varanes vologeses</i> (Jinja). |
| 3. | " " " <i>etesipe etesipe</i> (Jinja). |
| 4. | " " " <i>castor castor</i> (Jinja). |
| 5. | " " " <i>fulvescens monitor</i> (Jinja). |
| 6. | " " " <i>varanes</i> (Nairobi). |
| 7. | " " " <i>pollux pollux</i> (Jinja). |
| 8. | " " " <i>brutus brutus</i> (Jinja). |
| 9. | " " " <i>fulvescens ? acuminatus</i> (Kikuyu Escarpment). |
| 10. | " " " " " " " " " |
| 11—13. | " " " <i>ansorgei</i> (Kikuyu Escarpment). |
| 14—17. | " " " <i>varanes</i> (Nairobi). |
| 18. | " " " <i>jasius epijasio</i> (Jinja). |
| 19. | " " " <i>paphianus subpallida</i> (Jinja). |
| 20. | " " " <i>tiridates tiridates</i> (Jinja). |
| 21. | " " " <i>candiope candiope</i> (Nairobi). |
| 22—23. | " " " <i>citharon</i> (Nairobi). |
| 24. | " " " <i>etheocles etheocles</i> (Nairobi). |
| 25. | " " " <i>baumanni</i> (Nairobi). |
| 26. | " " " <i>numenes numenes</i> (Jinja). |
| 27. | " " " <i>anticlea adusta</i> (Jinja). |



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OENA CAPENSIS CAPENSIS, Linn. ♂

THE BIRDS OF KENYA AND UGANDA.

PART VII.

By

V. G. L. VAN SOMEREN, M.B.O.U., C.F.A.O.U., ETC.

FAMILY *COLUMBIDÆ*.

GENUS *OENA*, Swains.

Oena capensis capensis, Linn. Long-tailed Dove.

Ref. Linnaeus, Syst. Nat. 12th Ed. p. 286,
1766.

Type locality: Cape of Good Hope.

DISTRIBUTION:

Throughout Kenya and Uganda in suitable localities.

DESCRIPTION: MALE, ADULT:

Forehead and anterior portion of head to mid-orbital line, the whole of the throat and upper breast jet black; remainder of the head pearly-grey, paler at the line of junction with the black, and on the cheeks and side of neck. Nape, mantle and scapulars and innermost secondaries ashy-grey-brown shading to pearl-grey on the wing coverts; the innermost wing-coverts tinged with ashy-brown. The lower back is banded with three bars, two black, with a greyish-buff bar between; the rump is ashy-grey shading to grey laterally and on the upper tail-coverts; these latter with broad black-shaped tips. Primaries and primary-coverts bright cinnamon with broad blackish edges and tips, shading to greyish at the margins; secondaries cinnamon along the shaft with an increasing amount of greyish shading from without inward until the innermost ones are greyish-black strongly shaded along the outer web with pearly-grey; the edge of the inner webs inclining to black. Some of the inner long secondary-coverts are ornamented with steel-blue to purply-blue iridescent patches.

Breast and abdomen white, the former tinged with grey at the sides of chest. Central under tail-coverts black, lateral ones black and white or white. The rectrices are abruptly graduated the central pair being one and a quarter times longer than the outermost pair. On the upper side the central pair are ashy-grey at the base inclining to grey mesially, and towards the tips are blackish; the next two pairs are grey at the base, black at the distal half; the three outer pairs are light-grey with a broad sub-terminal black band while the outermost pair have the outerwebs white. From below, all the rectrices with the exception of the outer webs of the outer pair, are black.

Eyes brown or light brown; bill yellow at tip and red or carmine at the base; feet crimson or purple-madder. Wings 95-105 mm. Tail 140-145 mm.

FEMALE:

Differs considerably from the male; the black "front" is entirely wanting, instead, the front of the head is whitish shading to very pale grey on the cheeks and front of the crown, these in turn shading into ashy-grey-brown on the occiput, the ear covert, side of neck and upper chest. A black spot in front of eye. The mantle, scapulars and long coverts and inner lesser coverts are ashy-grey-brown merging into grey on the secondary and lesser coverts. Primaries and secondaries as in the male but with paler cinnamon; and the blue spots are more restricted. The rest of the plumage is similar to the male, though the tail is not so long. Eyes brown; bill purple-madder at the base, blackish at the tip; feet purple madder. Wings 95-100 mm.

JUVENILE:

The nestling plumage is ashy-grey above, each feather broadly tipped with buff, with, on the breast, a blackish pen-ultimate bar; the forehead and throat are whitish; the breast and abdomen a dirty white.

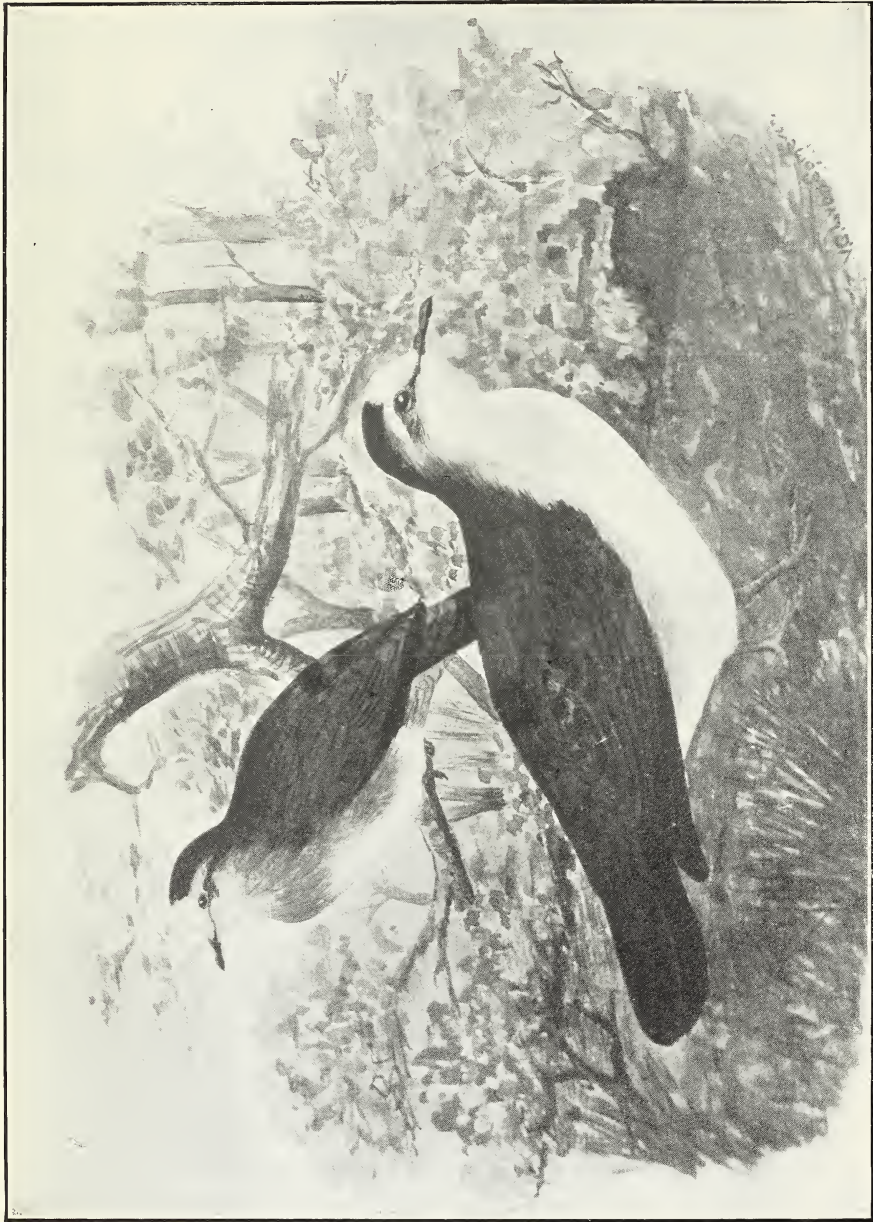
In the first feathered plumage the barred feathers of the head, mantle and chest persist for a long time the lateral aspects of the last area are the first to change to a greyish with narrow buff edges; the feathers of the scapular region, and the wing coverts have large sandy-buff tips edged with white distally and outlined proximally with black, giving to these areas a speckled appearance. The primaries and outer secondaries are cinnamon only on the inner webs, and all are tipped with rustybuff. The under tail-coverts and three outer rectrices are tipped with buff; the breast and abdomen are white.

HABITS:

The Little Long-tailed Dove is found from the Coast inland through Kenya to western Uganda. It is a bird of the open thornbush and park-like country and does not occur in the forests. We have no records of it having been seen anywhere over 6,500 ft.

It is particularly plentiful in the low country south of Nairobi to the coast, in the southern Masai Reserve, the Kedong, the country round Lake Victoria, through the northern Guasso Nyiro area to Baringo and Rudolf.

We have frequently seen this bird in native shambas, but examination of stomach contents has always shown that very little or no cultivated grain is taken, indeed the bulk of the food appears to be minute seeds of weeds, picked up from the ground.



TYMPANISTRIA TYMPANISTRIA FRASERI, Bp.

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They undoubtedly have a preference for open ground where these small seeds are readily picked up. Thus one seldom if ever sees the birds in grass veldt country. Though generally distributed throughout suitable localities in pairs or small parties, there are certain times when they occur in flocks of a dozen or more. This flocking is governed by the presence in a given locality of some particular seed to which the birds are partial. Usually one puts the birds up in pairs; the flight is quick and direct but of short duration, advantage being taken of the nearest cover behind which they drop and at once begin feeding. The Long-tailed Dove is undoubtedly the daintiest and most sprightly of the Ground-doves; its actions are quick yet full of grace. As the bird alights on the ground the tail is raised, partly fanned then depressed, but is usually carried above the tips of the wings. This movement is not peculiar to the species, for we find it in species belonging to the genus *Turtur*.

The nesting season is not fixed but is more or less influenced by the rains. Most nests have been found towards the end of the rains, thus we have records for January to March and from August to October and in December. The nests have always been very near the ground, in fact on more than one occasion the nest has actually been placed on the top of an ant-hill surrounded by vegetation but usually it is built about a couple of feet up in fairly thick cover preferably a creeper. The actual nest is a platform of slender twigs and rootlets mostly the latter, so that actually it is more compact than the usual run of Dove's nests. The eggs, two in number are small 15 x 20 mm., and pale cream in colour with a semimatt surface. Both parents take part in constructing the nest. Although this is a common species, I have never heard its call, nor can I find any description of its note.

GENUS **TYMPANISTRIA** Reichb.

Tympanistria tympanistria fraseri Bp. White-breasted Wood-Dove.

Ref. : Bonaparte, Consp. Av. ii, p. 67. 1855.

Type locality : Fernando Po.

DISTRIBUTION :

In wooded districts through Uganda and Kenya.

DESCRIPTION : MALE, ADULT :

The front of the head to the mid-orbital line pure white, this colour extending back over the eye and downwards to the posterior aspect of the ear-coverts. A black streak in front of the eye. The throat, cheeks, breast and abdomen pure white; the flanks white washed with ashy-brown. The remainder of the crown dark ashy-brown inclining to greyish at the junction with the white forehead,

and on the posterior earcoverts, becoming more brownish at the nape and neck but tinged with grey where it joins the white of the fore neck and breast. Mantle, scapulars, wing-coverts and inner secondaries, rump, upper tail-coverts and tail, hair brown with a bronzy-gold sheen, duller on the rump, but with a rufescent tinge on the rectrices. The rump is crossed by two dark-brown bands with a light brown area between. The primary coverts, the primaries and secondaries cinnamon, shaded on the outer webs and ends with dark brown. On the inner secondary coverts and innermost secondary are four to five dark blue, purple-blue to black metallic spots. The under tail-coverts are grey-brown while the under surfaces of the rectrices are greyish at the bases and tips with a blackish bar subterminally.

Under wing-coverts and axillaries cinnamon. Eyes brown; bill purple madder at the base and black at the tip; legs purple madder. Wings 115-120 mm.

FEMALE:

Adult: Somewhat like the male, but with the white of the forehead tinged with grey, as are also the cheeks; the throat is white but shades off gradually into a very delicate blue-grey at the breast band. The ear coverts are dark-brown. The depth of colour of the breast-band varies; in some specimens it is decidedly grey while in others it is merely tinged. The mature, though youngish female has a decided band which is tinged with ashy-brown. Wings 111-115 mm.

JUVENILE:

The nestling has a distinct plumage, traces of which are retained up to the sixth month. The forehead and eye stripe are cinnamon, becoming darker, more brownish on the back of the crown and neck; each feather with a tip and bar; the mantle and wings are light reddish-brown barred with darker brown; the feathers of the scapulars and inner secondaries with pale tips.

The throat, chest and breast are tawny ochreous, banded with dark brown; the abdomen is a buffy white.

This barred plumage lasts about four months (captive birds) when either the full male or female plumage is assumed straight away, with no intermediate dress.

HABITS:

The White-breasted Wood-Dove is found from the Coast to Lake Victoria and throughout Uganda, but only in such localities as are suitable. It is a bird of the forests and well wooded areas, and of tree-fringed rivers. Away from habitations it is a decidedly wild and

shy species, intolerant of man and excessively timid. In certain well-timbered gardens in Nairobi, however, where the birds have nested regularly for many years they have become quite tame. In spite of its very contrasty plumage this bird is difficult to detect in the half light of the forest either when feeding on the ground or in flight away from one, but if it should turn side-on the white underside is very conspicuous. Its flight is extremely rapid, seldom straight, usually zigzag, and never high; the marvellous thing is that even at such a high speed it can dodge amongst the branches of low trees without coming into contact with some obstacle. Their eyesight must be acute, for on one occasion when trapping birds in the forest I had a hang-net stretched across a narrow "ride," a Dove suddenly shot into the space and I made certain that it would dash into the obstacle, but within a foot of the net it suddenly shot vertically up and carried on! Though the contrast between the dark upper and white lower surfaces is so great yet when the bird is sitting in a tree it is hard to detect; the outline is completely broken.

These birds take all their food on the ground; it consists of seeds, small land shells, and insects. They take well to captivity and readily eat a mixture of meal and hard-boiled egg. They nest regularly and rear their young with care. In the wild state there appears to be no fixed nesting season; we have seen nests in every month of the year except January and February.

The nest is a flimsy structure composed of slender twigs and rootlets and built fairly low down, seldom more than twenty feet from the ground, usually about ten. The actual site is usually a shady spot well protected above by overhanging branches, but the nest is usually visible with ease from below. Jackson has recorded the nest of this species built on top of a disused Coly's nest.

The call is peculiar and though somewhat like that of two other species of ground-dove, is however distinctive. It is rather a mournful though sweet sound consisting of two quite loud and prolonged coos followed by seven coos gradually diminishing in intensity and tone until the last is almost inaudible.

During the nesting season one meets these birds in pairs, but at other times they are solitary. One may occasionally come upon a family party of four, but it is remarkable that only one young appears to survive. Either an egg is knocked out of the nest or one of the newly fledged youngsters falls a prey to some enemy before it can fly properly. The young are fed for quite a long time, but as soon as they can fend for themselves they are driven off by their parents. In spite of its protective colouration, I have more than once seen an adult dove captured by Verreaux's Falcon and have seen the remains of birds undoubtedly captured by Gennetts, the latter probably having

secured a roosting victim. The species in common with others of the family is very conservative with regard to a particular roosting place. The same branch will be used for months on end even when the nesting season is on.

This Wood-Dove is equally tenacious in adhering to a restricted locality; in one particular forest which I used to visit at least once a week for the greater part of two years, I could always count on seeing at least four pairs of these doves, each pair within quite a small area of about five acres or so; there was never more than just the pair except when the young were newly on the wing.

GENUS **TURTUR**, Boddaert.

Turtur afer kilimensis, Mearns. Blue-spotted Ground-Dove.

Ref. Mearns, P.U.S.M., Vol. 48, p. 383, 1915.

Type locality: Kilimanjaro.

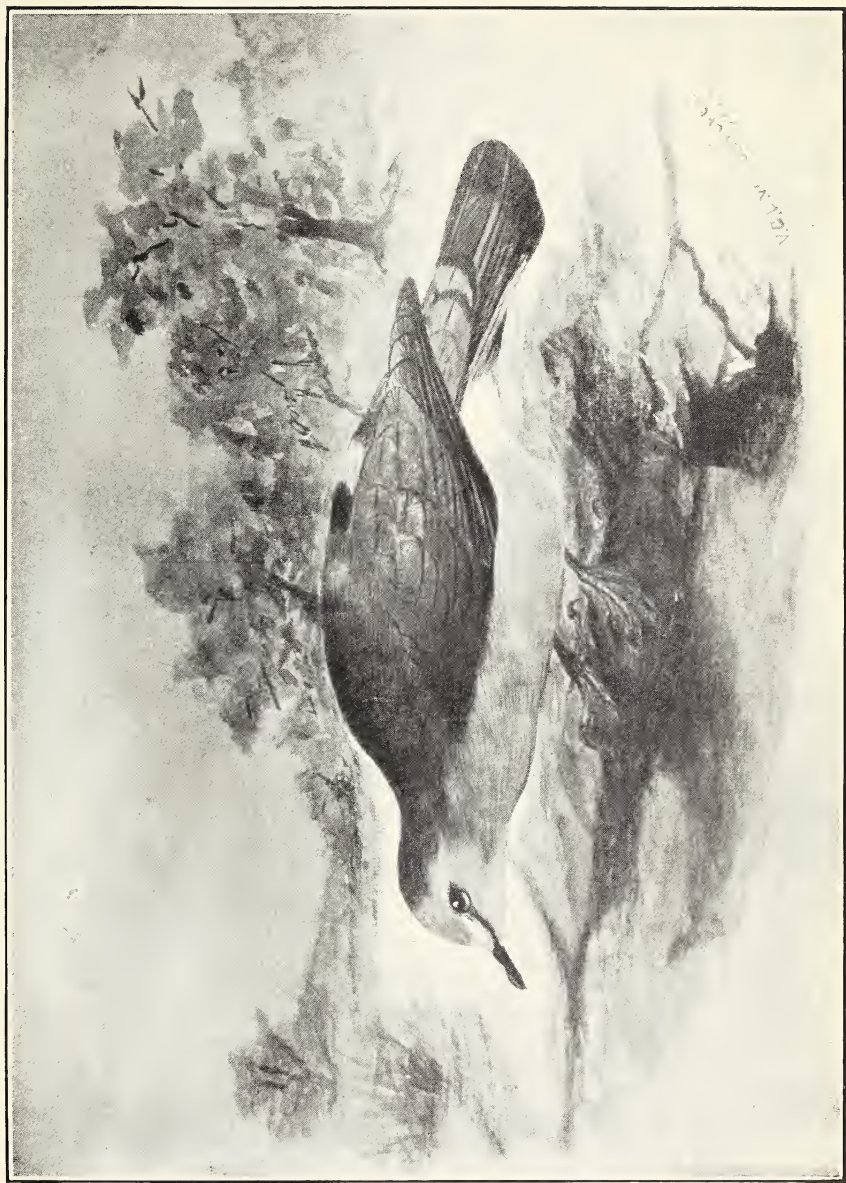
DISTRIBUTION :

From the south-western districts of Kenya through Uganda.

DESCRIPTION : MALE, ADULT :

Forehead white shading to pearl and then lead-grey on the top of the crown and to ashy-grey on the occiput, and extending over the eye to the side of the crown as a blue-grey streak, outlined along the lower edge and round the eye with white.

Nape and hind-neck ashy-brown shading to umber-brown on the mantle and to greyish-umber-brown on the wing-coverts. Throat white or pinkish-buff shading to vinaceous-drab on the cheeks and ear-coverts and to vinaceous-brown with a greyish bloom on the chest, which in turn shades off into pinkish-buff on the abdomen to become buffy-white on the vent. The lateral under tail-coverts are white, the central ones black. The three inner long secondary coverts have each a large metal blue spot, in front of which are other three spots of the same colour on the upper lesser coverts. The primaries and outer secondaries are cinnamon edged and tipped with brownish-black, while the inner secondaries are also cinnamon centrally but with an increasing amount of umber-brown shading, from without in; the innermost being uniform brownish. The lower back, rump and upper tail-coverts are umber-brown; the rump is crossed by two broad black bars with an ochreous-buff bar between, while the terminal coverts are tipped with black. The rectrices on the upper surface are mostly brownish but the three outer pairs are grey on the inner web, washed with brown on the outer web; that of the outer pair white. The three outer pairs are banded with black subterminally while the rest are shaded black at the ends. The under wing-coverts and axillaries



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TURTUR AFER KILLIMENSIS, Mearns.

are light cinnamon. The eyes are brown or red-brown; the bill carmine or purple-madder at the base, shading to pinky-yellow at the tip; legs purple-madder. Wings 105-113 mm.

FEMALE:

The female resembles the male.

JUVENILE:

The nestling plumage is a rufescent brown above and on the chest, barred with blackish-brown; the feathers of the scapular region and inner coverts with buff tips. The remiges are cinnamon with dark tips and edges and dark vermiculations. The forehead is buff as is also the belly. The bill and legs are brownish-purple.

The first full feathered plumage is an admixture between the nestling and adult phase. The characteristic metallic spots appear on the wing but the tips of the feathers so decorated are barred with alternate brown and blackish bands. The breast, mantle and lesser coverts are similar to those of the adult. The bill and legs remain blackish until the adult plumage is assumed.

HABITS:

The Blue-spotted Ground-Dove has a peculiar distribution in Kenya, being found only in the south-western corner of the Colony whence it spreads up through Tanganyika into Uganda where it is plentiful and widely distributed. It occurs in the Kavirondo country and Kisii area but does not come into the highland area of Kenya, nor do we find it in the Coastal zone. It lives in all types of country other than dense forest and open grass plains; it is partial to cultivated areas round habitations and scrub country.

It is remarkably tame and will merely flutter out of one's way. It has a habit of squatting on the ground if anything comes near it and not taking wing until the last moment when it springs up suddenly with a flutter and goes off with a zigzag flight to pitch almost at once in some open spot. When the bird alights it raises and dips its tail, fanning it just as it touches the ground.

The species is almost entirely terrestrial, seeking the majority of its food below the dwarf acacias and scrub and in patches of native cultivation. One may frequently see these birds feeding along road-sides and it is with difficulty that they can be made to leave the track; they merely fly a few paces ahead of one and having alighted they at once commence to feed. Although a common species one usually meets the birds in pairs, often singly, never in flocks. The call note is distinctive and fascinating though rather plaintive; it is usually uttered when the bird is in a tree and resting, and consists of a series of coos, the first very low and almost inaudible, coo, coo-

coo, coo-coo, coo-coo, tu, tu, tu, tu, tu, tu, tu, increasing in tone and volume up to the last coo and then descending rapidly in decreasing tone.

Nests and eggs of this species have been taken or seen in almost every month of the year, but the majority have been recorded between July and December. The nest is a frail structure, composed of fine twigs and rootlets, placed rather low down in some small shady tree on a convenient horizontal fork. We have on occasion found the nest on the top of a wide-spreading papyrus stalk and very frequently the nest has been built on an Ambatch tree growing well out in the water near the lake side. They occasionally make use of an old nest such as that of the Little Green-backed Heron, or as recorded by Jackson, that of the Uganda Thrush (*T. p. centralis*).

The eggs, two in number, are a pale creamy white, with little gloss; measuring 22 x 16-17 mm. Both parents take part in incubating the eggs and feeding the young.

Turtur chalcopilos chalcopilos, Wagl. Emerald-spotted Ground Dove.

Ref. Wagler, Syst. Av. Columba, sp. 83, 1827.

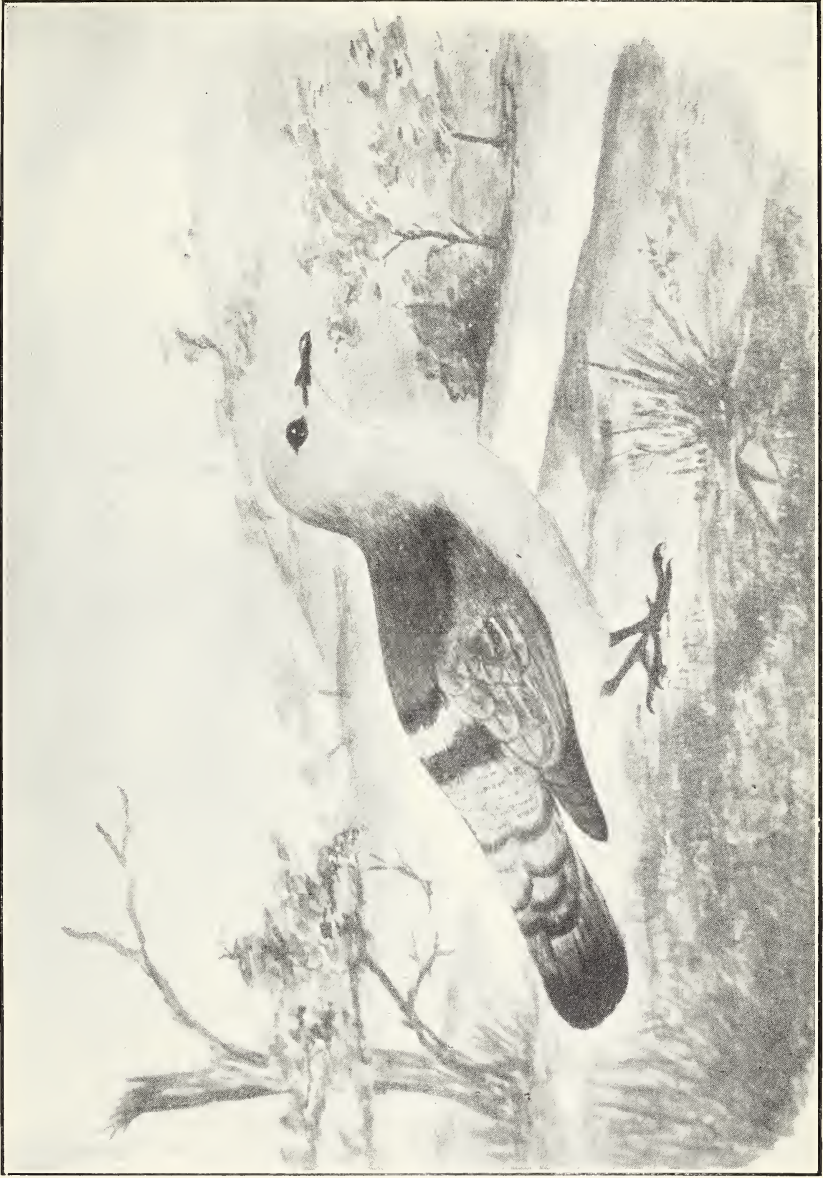
Type locality: Eastern Cape Province.

DISTRIBUTION:

In the dry thorn-bush and scrub country from the Coast to Victoria Nyanza.

DESCRIPTION: MALE, ADULT:

Forehead, cheeks and ring round the eye, very pale greyish becoming darker grey on the top of the head and shading to slatey-grey on the occiput. There is frequently a blackish line from the anterior angle of the eye to the gape. The throat is whitish shading to very pale pinkish on the sides of the neck and to darker vinous pink on the breast, this in turn shading to paler pink on the flanks and to white on the centre of the abdomen and vent. The pink on the sides of the neck shades into ashy-grey-brown on the hind-neck. The mantle scapulars and coverts and the innermost secondaries brownish-grey; the four innermost secondaries and the four inner secondary coverts each with a large subterminal metallic green spot on the outer web. All the primaries light cinnamon with narrow blackish edges and tips; while most of the secondaries are cinnamon with ashy-grey outer margins and ends. The primary coverts are cinnamon with blackish outer edges and tips. The under wing-coverts and axillaries are pale cinnamon. The back is greyish-brown, crossed by a narrow black bar; the rump is pale brownish grey crossed by a wide black bar; the upper tail-covert are pale grey-brown with black ends, forming



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TURTUR CHALCOSPILUS CHALCOSPILUS, Wagl.

a third bar. Most of the rectrices are grey at the basal $\frac{3}{4}$, with the terminal $\frac{1}{4}$ blackish; the three outer pairs are grey tipped, while the basal $\frac{2}{3}$ of the outer web of the outermost pair are white. The under-surface of the tail is black. The under tail-coverts are mostly black; the lateral feathers are white.

Eyes brown; bill crimson at base, tip black; legs and toes purple-madder. Wings 96-108 mm.

FEMALE:

Very similar to the male; but rather paler on the head and breast.

JUVENILE:

The first feathered plumage is very like that of *T. afra kilimensis*, but paler throughout, so that the blackish and dark barring is more conspicuous.

In the second plumage the barring is retained on the crown, breast and ends of the secondaries and secondary coverts, the latter having white tips; while the tips of the primaries are cinnamon. The remainder of the plumage is very like that of the mature bird but duller and paler, the feathers of the scapular and dorsal regions with pale buffy tips.

HABITS:

This beautiful little Dove with its soft delicate colouration is one of the features of the Coastal zone and the dry thorn-bush country. It is much more a bird of the desert scrub and wasteland than is *T. a. kilimensis*, and although very similar to it in habits, is much more timid and less sociable. In the Highlands it has become a feature of the coffee shambas, particularly those which are kept free from rank vegetation and weeds. One or two birds can usually be seen feeding between the rows of coffee trees. When once a pair has taken to frequenting a particular area of coffee, they remain in the vicinity for months, and indeed make use of actual trees to nest in. The upper branches of a coffee tree which has been pruned and topped makes an ideal nesting site and is most attractive to these birds. The food of these Doves consists mostly of minute seeds of weeds, with an occasional mollusc and insect. These birds are very fond of white ants, especially the flying forms of the smaller species.

Although feeding principally on seeds of weeds these birds are not adverse to taking small grain such as Whimbi, Mwele and Mecombe. They do not attack the standing grain but take the fallen seed from a plot that has been reaped or grain dropped in transit.

The Emerald-spotted Ground Dove does not occur in flocks but is met with singly or in pairs. When found near human habitations they are much tamer than in the bush country and with proper treatment can be induced to remain in one's garden for years. They

becoming exceedingly tame and confiding. Their call is low and plaintive and though somewhat like that of *T. a. kilimensis* is quite distinguishable even at a distance. It consists of two long and low coos, followed by two shorter coos, then a pause, then follow eight rapid coos in descending scale and diminishing tone.

These little Doves have a remarkably rapid flight, but seldom of long duration, in fact if they are put up suddenly they fly only a short distance and alight abruptly. Just before settling, in order to break the impetus of flight, they zigzag slightly and when they alight they rapidly raise and lower the tail and posterior part of the body, at the same time the tail is slightly fanned. The movement is actually an exaggeration of the similar habit found in the Blue-spotted Dove.

As has already been mentioned, these birds are very fond of nesting in low coffee trees and in the uncultivated areas one seldom finds a nest in any other but a low bush or tree. The nest itself is often quite exposed but sheltered above and is constructed of a few twigs and fine rootlets with no lining. It is a frail structure and very loosely put together. The eggs, two in number, are a very pale cream, almost white and measure 23-23.5 x 18 mm. We have records of nests found in January to July, and November and December, while young just from the nest have been seen in June and July.

The young remain with the parents until able to fend for themselves; they are then driven off.

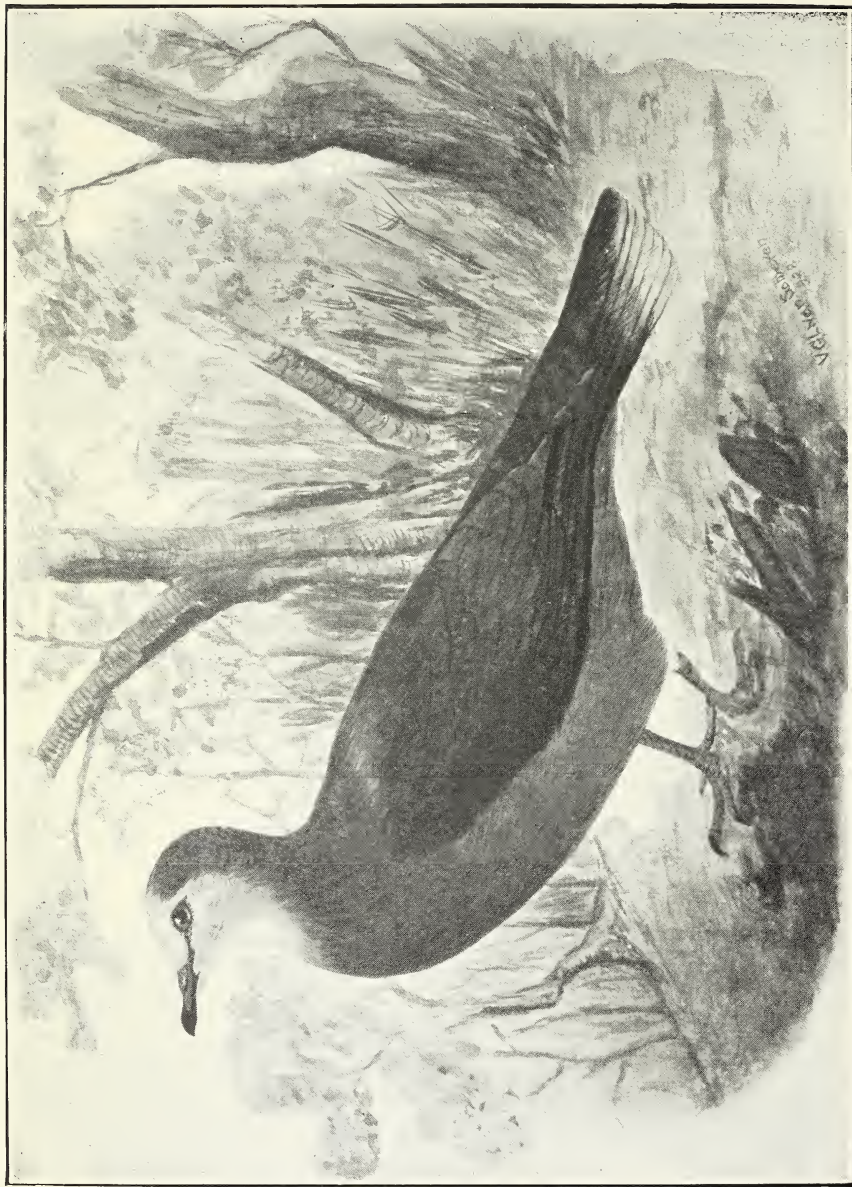
This little Dove makes an excellent aviary bird and if well looked after will nest readily. It is rather susceptible to change of feed and environment which is shown by a strong tendency to a form of melanism. In some of my specimens the primaries became a dark brownish black, all trace of the cinnamon colour being lost, while the mantle and wing-coverts not only became darker but the actual structure of the feathers changed; quite a number became metallic green, while those feathers which normally had a large metallic spot became entirely iridescent.*

Turtur abyssinica delicatula, Sharpe. Black-billed Blue-spotted Ground Dove.

Ref. Sharpe, Bull, B.O.C., Vol. XII., p. 84, 1902.

Type locality: White Nile.

*FOOT NOTE.—Considerable controversy has recently arisen over the matter of the correct published names applicable to the two species of metallic-spotted Ground Doves. I have followed Sclater, *Bul. B.O.C.*, Vol. xlii., pp. 117, 118, May, 1922.



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APLOPELIA LARVATA LARVATA, Temm. & Knip.

DISTRIBUTION :

The extreme N.W. corner of the Nile Province of Uganda.

DESCRIPTION: MALE, ADULT :

Very like *T. c. chalcospilos*, but altogether paler especially on the breast and underside; these being a very delicate vinous pink. The fore-part of the head, including the throat almost white; the occiput and nape grey. The spots on the wing *iridescent metallic-blue*. The bill is uniform black, while the feet and legs are purple-red or madder.

HABITS :

In every way similar to the Green-spotted Dove. We have no record of its call or nesting habits. This is a bird of the Sudan which extends into Uganda just south of Nimule. We possess an adult female and an immature male taken at Nimule.

GENUS **APLOPELIA**, Bonaparte.

Aplopelia larvata larvata, Temm. and Knip. Cinnamon-breasted Forest Dove.

Ref. Temminck & Knip. *Pig. Colombes*, p. 71, 1810.

Type locality: Knysna, Cape Province, S.A.

DISTRIBUTION :

The forests of Kenya from Kilimanjaro to Mt. Elgon.

DESCRIPTION: MALE, ADULT :

Forehead to mid-orbital line white, shading to grey and grey-brown on the occipital region and nape, these areas with a violet-bronze reflection. Throat white, shading to pale ashy-grey, with pink bloom on the cheeks and ear-coverts. Back, sides and front of the neck violet-bronze with greenish reflections; mantle leaden-grey with purple-greenish tips to the feathers, those of the mid-scapular area being markedly green. Scapulars, wing-coverts, rump and upper tail-coverts glossy olive brown, slightly rufescent on the last area. Breast coppery-vinous-grey, shading into cinnamon on the lower breast, flanks, abdomen and under tail-coverts; the flanks slightly tinged with greyish. Primaries and secondaries, olive-brown with slight greyish sheen at tips, and edge of outer webs. Rectrices mostly blackish-brown with a wide grey tip; central and next pair uniform olive-brown with a tinge of brown on the outer web of the third pair. Wings 148-152 mm. Eyes claret or crimson; bill dark purple at base, black at tip; legs and feet purple madder or mauve; eyelids crimson.

FEMALE :

Somewhat like the male but slightly duller and darker on the breast and with the forehead tinged with grey.

JUVENILE :

The nestling plumage is a rufescent-brown ground colour rather more ochreous on the head and abdomen, more blackish on the mantle and wings, each feather with two or more blackish bars, those of the last two areas with rusty-brown tips. The throat is ochreous. In the next plumage the forehead and throat are ochreous, the former with blackish barring; the hind part of the crown is blackish narrowly barred with rusty brown; the hind neck and breast are rusty-brown with faint blackish barring, while the flanks and abdomen are dull cinnamon. The mantle, wings, rump and upper tail-coverts are dark olive brown, each feather with rusty-brown tips. This plumage soon merges into that of the adult, the first areas to change being the forehead, mantle and underside.

HABITS :

This Dove has a fairly wide distribution in Kenya being found wherever there are patches of forest of sufficient density to give it cover. The southern limit appears to be Mt. Kilimanjaro and the Taveta Forest; we have no records of its occurrence at the Coast. It is fairly common in the forests round Nairobi and Ngong, plentiful in the forests of Mt. Kenya, the Mau and Cherangani and not uncommon on Mt. Elgon which area appears to be its northern limits.

The Cinnamon-breasted Dove is somewhat rare in collections owing to the fact that it haunts the densest parts of its forest home and though it may possibly be flushed quite often, it darts into the undergrowth with such rapidity that it gives one little or no chance to shoot. The most successful way to observe these birds is to "bait" a spot likely to be frequented by them. There used to be a special spot in the Karura Forest where one could always be certain of flushing one or a pair of these birds. The area was low-lying and moist, with dense forest and rather thick undergrowth. There was however a certain tree in the middle of the spot to which the Red Duiker used to resort and use as a "rubbing post"; hence there was a well-worn track to the spot, and along it one could obtain an excellent view of the ground. The "baiting" of this ground resulted in unrivalled opportunities for close observation of the Doves, and other birds also. The ground was covered in a thick layer of damp leaf mould which yielded an abundance of small land molluscs, insects and seeds of various kinds, and it was on these that the doves were feeding. The birds seemed to quarter the ground systematically, turning up the leaves with the tip of the bill, often to a depth of two or three inches.

Most of the seed taken was small, black and polished, somewhat like linseed, but I was unable to trace from what plant they were derived. Seed taken from the crop and sown, did not germinate.

At certain times of the year the crops of these doves are full of small bulbous roots which have a high water content, and are sweet to the taste.

When walking on the ground these birds nearly always carry the tail above the wings. They feed mostly in the early mornings up to about 11 a.m., and then roost in some low bush under dense shade; the second period of feeding starts about three, but if there are young to be fed one may find them collecting food at any time during the day. I have never heard the call of these birds nor is there any published description of it. During the many occasions that I have watched them, the only note has been a low whee-u when the cock bird has approached near his mate.

Nests of this Dove have been recorded in March, May and June and young just out of the nest in August, May, and July. The nest has usually been in a small bush amongst thick undergrowth, but on one occasion we took it on a trunk of a large tree which had been blown down and from which a clump of young shoots were growing; the nest was built at the base of these shoots. The eggs are white and two in number, measuring 26 x 21 mm.

Before the Agricultural Department destroyed the patch of primeval forest at the foot of my garden, a pair of these Doves lived in it for more than three years and successfully reared two broods each year, but since the forest undergrowth was cleared, not a single nest has been found, though an occasional bird visits the spot from time to time.

Aplopelia simplex jacksoni, Sharpe. Uganda Grey-breasted Forest Dove.

Ref. Sharpe, Bull. B.O.C., Vol. XIV., p. 93, 1904.

Type locality: Ruwenzori.

DISTRIBUTION:

Uganda. From Ruwenzori to the Mabira Forest.

DESCRIPTION: MALE, ADULT:

Throat and forehead very pale grey, the latter shading to slatey-grey on the crown. Nape, hind and side of neck bronzy-pink changing to bronzy-green on the mantle and scapulars, the mantle with a greyish sheen. Wing-coverts, primaries and secondaries, rump, upper tail-coverts and central pair of rectrices olive brown with a rufescent sheen. Remainder of rectrices with dark grey, terminal inch

light grey. Cheeks and lower-throat grey merging into bronzy-pink with greeny sheen on the breast; flanks dark-grey, abdomen light-grey shading to pale-grey or whitish on the under tail-coverts.

Eyes red-brown to purple madder; bill black; legs and feet dark-crimson to purple madder.

FEMALE:

Forehead and throat greyish; nape, mantle and scapulars with a bronzy sheen. Breast, abdomen, flanks and under tail-coverts vinous-greyish. Tail as in the male. Soft parts as for the male.

JUVENILE:

We have no specimen of the nestling plumage nor is there any published description. In the second plumage the fore part of the head to the lower throat are dirty-white cross-banded with rusty-brown. The nape to the upper tail-coverts are earth-brown with rusty-brown tips; the breast and flanks are rust-brown with blackish-brown barring. The abdomen and flanks and under tail-coverts are rufous.

HABITS:

This forest Dove is by no means common and although it has been recorded from most of the large forests of Uganda little is known regarding its general habits or nesting seasons. Jackson's native collector found the birds nesting in May, while my collection contains a quite young bird shot in December—probably a bird hatched in August. Like *A. larvata*, this species keeps to the thicker parts of the forest undergrowth, and owing to its dull colouration is extremely hard to detect; one usually becomes aware of the bird's presence by the sound of rapid flight with possibly just a glimpse of a dove-like form disappearing into a thicket. They are extremely shy and move off at the slightest noise. They are entirely ground feeders.

GENUS **VINAGO**, Cuvier.

INTRODUCTION:

The Genus *Vinago* is applied to a compact group of Pigeons with sexes alike which are characterised by very heavy hooked bills, with a varying length of cere or naked soft parts extending from the base of the horny tip to the commencement of the forehead feathers; by their comparatively short wings and their compact dense plumage which consists of varying shades of grey, green and yellow (hence the generally applied name—"Green Pigeon" or Green Fruit-Pigeon). They are near relatives to the Indian Treron and Osmotreron.

GROUP HABITS:

The popular name "Fruit Pigeon" has been applied to these birds on account of the fact that the bulk of their food consists of

fruit of various kinds, varying from the small black fruit of *Trema guineensis*, Ficalho, to a large plum-like fruit common in certain forests, or to the large fig of the *Ficus mallatocarpa*, Warb. Green-Pigeons of various species and geographical forms extend from the Coastal belt up to the forests of the highlands up to about 8,000 feet, and throughout Uganda. Though actually occurring in the forests, they are seldom met with in such but are much more plentiful and more in evidence in the more open park-like country where there are large trees with a predominance of fruit-bearing species or along timbered watercourses. They are not at all adverse to frequenting some particular fruit-bearing tree which may be growing in almost complete isolation in some open cultivated area, when the fruit season is on. Because of the great difference in the times when certain fruits and berries are in season in various localities, these birds have become great wanderers or local migrants. It is an undoubted fact however, that in a given locality where certain fruit trees come into bearing with regularity or fixed seasons that one can count on Green-Pigeons being there at that particular time. Their presence is thus governed largely by the food supply. There are however, in Kenya and Uganda, certain localities where the pigeons are present throughout the year, but in these particular areas their diet is not limited entirely to fruit; they have taken to feeding on standing green Maize and Mtama. There are two main periods at which these birds feed: early in the morning from about six to ten and again in the evening from four to six. Between times they rest, either sitting motionless or preening themselves. They sometimes rest in the food tree, but more often they leave their feeding grounds for some roosting place, possibly miles away. The general colour of these birds harmonises so completely with the foliage that it is well-nigh impossible to discern a sitting bird. One may know perfectly well that Green-pigeons are in a tree, but when one comes right under it and scans the branches not a bird is to be seen; presently however, a slight movement will direct one's attention to a certain spot, and on careful search perhaps one bird may be detected, a little later possibly two, three or more, all within a short distance of one another in the actual spot which one has been observing for some time. Green Pigeons are easily alarmed and if a tree, into which birds have been seen flying, is approached carelessly, out they go in the direction opposite to one, with a clatter of wings which is quite bewildering. Their flight is extremely strong and swift yet rather erratic; they are given to sudden alteration in height and direction. Birds which appear to be coming straight towards one will suddenly dip and ascend with such rapidity as to be quite disconcerting.

From the sporting point of view, Green-Pigeons are hard to beat; they offer a great variety of most difficult shots and if correctly

handled will maintain a fairly steady stream of coming and going birds so that the " bag " will be good. If the birds have already assembled at a feeding tree, it is inadvisable to blaze off too many shots at birds which have been disturbed at one's approach; the better plan is to take a right and left and then station the guns at some little distance on two sides of the tree and take the in-coming birds. If the shoot commences in the early morning, one can be certain that quite a number of birds will be induced to return to the tree time after time even when shot at, being compelled to do so by their almost insatiable appetites. Green-pigeons are most voracious feeders and will devour vast quantities of fruit; small yellow figs are swallowed whole, the elasticity of their gape is wonderful, and the size of the berries they swallow is considerable. What digestion these birds possess is very rapid; they evacuate masses of apparently half digested fruit as rapidly as they take in fresh food. With all their actual greediness they are extremely wasteful. One has only to sit beneath a tree in which a flock is feeding to realize the quantity of fruit which is " billed " and allowed to drop. These birds are wonderful climbers, their short strong legs and prehensile toes are used to great advantage; they will sidle along a very slender twig which bends with the weight of the bird, right up almost to its tip in order to secure some coveted berry at its extremity. Time after time I have watched a bird manoeuvring thus and when almost within reach of the desired fruit, suddenly swing over head foremost, but still grasping the twig, hang upside-down and secure the prize. Mention has already been made that in certain localities these Pigeons have taken to eating green Maize. This is particularly the case in parts of the Eastern Province of Uganda and in the Meru country in Kenya. I have observed the birds tearing open the fully formed but not ripened cobs and wrenching off the seeds. They only take those seeds which are still in the " milk " stage.

In the first mentioned locality, my " bird boys " succeeded in capturing quite a number of *salvadorii* in traps baited with green Maize.

Green-pigeons do very well in captivity, but they require an abundance of food. They will take such fruit as bananas, pawpaw, guavas, figs and such-like and a mixture of posho and boiled rice. They are rather sluggish when caged, even in big aviaries, and are thus less attractive than some of the small Doves. The plumage of these pigeons is influenced by captivity, especially if the aviary be very shaded and humid. Some of my captive birds became quite blackish all over, and remained so, so long as they were in a certain aviary, but after two moults in a bright sunny run they reverted to their normal colour. The food given to them remained the same,

thus one is led to think that it was entirely a matter of environment. Green-pigeons are rather quarrelsome birds in spite of being gregarious; one often sees them fighting over some special cluster of wild figs, but there is actually more vociferous display than actual force.

Only on one occasion have I seen these pigeons drinking in the wild state. They did not actually alight on the ground and drink at the water's edge but selected a branch of a tree which dipped into the running stream and sidling down this they stood almost upside-down and inserting half the head in the water took rapid gulps without withdrawing. My captive birds took their drink by hanging onto the wire netting above the water pot and stretching down to it.

These Pigeons are very susceptible to shock. Some of my captive specimens died through sheer fright; a sudden loud noise, or on one occasion the sudden appearance of a Genet cat which certainly did not actually touch a bird, caused two fine healthy males to drop off their perch and die instantaneously. I had twice experienced a curious thing when pigeon shooting which I could not account for until the above happened to my captive birds. There is a large fig tree just outside my study window which is much frequented by Fruit-pigeon when the berries are ripening; one day I shot a bird feeding well out towards the edge of a branch and as it fell another dropped almost at my feet having come from a branch at least ten feet away from the bird I fired at. This second bird did not have a single shot mark anywhere or even a graze. When I fired the shot I was well concealed and took the birds unaware so that the fright was a sudden one; death was undoubtedly due to shock. On another occasion two birds dropped dead out of a branch on the opposite side of a tree near which I took an incoming bird; both were untouched by shot as I had fired in the opposite direction.

Some of these pigeons always lay only one egg, in others the clutch is two. The nest is usually built in a low tree sometimes quite exposed. Both parents brood and are close sitters. Incubation lasts 14—16 days. Sometimes two or more nests may be found within a short distance of one another, but usually they are rather scattered.

Actual records of nests found will be given under the several species described.

Vinago waalia, Meyer. Grey-headed Yellow-bellied Green Pigeon.

Ref.: Meyer, Syst.-Sum. Uebers. Zool. Entdeck., p. 128, 1793.

Type locality: Lake Tsana.

DISTRIBUTION :

Uganda; Northern and Eastern Province. Kenya: Northern Frontier and Jubaland.

DESCRIPTION: MALE, ADULT :

Entire head, neck, upper mantle and upper breast blue-grey with a slight olive-green wash; remainder of mantle, scapulars, back, rump and upper tail-coverts pale olive-green; bend of wing, most of the lesser and outer median coverts purply-grey, the outer median coverts edged with bright yellow. Primary coverts black; secondary coverts: outermost black, inner ones shading to olive, all widely edged with bright yellow. Most of the secondaries grey-black, innermost olive, all narrowly edged with pale yellow. Primaries blackish with very narrow whitish margin to outer webs. Breast and centre of abdomen bright yellow fading to white on the ventral area and to olive-grey and white and grey on the flanks. Under tail-coverts broadly buffy-white on the outer webs, inner webs pale chestnut: the shorter feather olive-grey basally and on inner webs. Under wing-coverts, axillaries and undersurface of the wing, grey. Under side of tail grey-black distally tipped with light-grey; upper side of rectrices, mostly dark grey basally, distally light grey, two central pairs uniform grey. Eyes violet and blue or red and blue; Bill, tips horn bluish-white, base maroon; legs and toes lemon-yellow. Wings 170-185 mm.

FEMALE :

Rather like the male but smaller and duller.

JUVENILE :

The nestling plumage is superficially like the female but is greener on the head; lacks all trace of purple on the wings and the upper breast is dirty greenish while the lower breast is dirty yellowish.

In the next plumage the yellow appears on the lower breast and there is a trace of purple on the "shoulder". The head and neck are olive-grey.

HABITS :

This very fine Fruit Pigeon is apparently limited to the more northern and eastern districts in Uganda and to the drier parts of Kenya and Jubaland.* It frequents areas in these localities where there are plenty of trees, not amounting to forest, such as the park-like country and timbered river-beds. Very few are strictly resident, most are local migrants, their appearance in a given locality coinciding with the ripening of some particular fruit or berry. They are especially fond of the various species of small wild fig and when these are in season large flocks gather together and clear up the whole crop of fruit in a few days.

* Birds from Jubaland probably represent a distinct race.



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VINAGO WAALIA, Meyer.



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VINAGO CALVA BREVICERA, Hartert & Goodson.

Vinago calva salvadoril, Dubois. Uganda Green Fruit Pigeon.
Ref. : Dubois, Proc. Zool. Soc. 1897, p. 784.

Type locality : Western shores Lake Tanganyika.

DISTRIBUTION :

Throughout Uganda east to Elgon and to the Mau in Kenya.

DESCRIPTION : MALE, ADULT :

Entire head, neck, and breast yellowish-olive-green becoming yellowish on the upper abdomen then white at the vent; flanks greyish-olive. Lower part of hind-neck with a blue-grey band which shades into the greyish-olive of the mantle, back, rump and upper tail-coverts. Bend of wing purple-grey shading into the greyish-olive of the coverts; the outer median, and the secondary coverts with pale yellow edges on the outer webs. Primaries and secondaries black with narrow yellow edges; primary coverts black. Undersurface of wing, under wing-coverts and axillaries grey. Rectrices on the upper side grey with a terminal band of lighter grey, the central pair almost uniform grey; on the underside the tail is blackish with a terminal bar of whitish-grey. Long under tail-coverts pale cinnamon with buff tips and outer edges, rest whitish with olive centres. Thigh feathers with dark gery-olive centres and white margins; leg feathers canary yellow.

Eyes with an outer ring of red to lilac, inner ring blue; bill horn-blue-grey at tip or whitish, soft part and nostrils coral red or deep orange red; 12-14 mm.; feet coral red. Wings 165-178 mm

FEMALE :

Like the male, but usually smaller.

JUVENILE :

Unknown to me.

HABITS :

See introduction.

Vinago calva brevicera, Hartert and Goodson. Kenya Green Fruit-Pigeon.

Ref. : Hartert and Goodson, Nov. Zool. xxv,
p. 353, 1918.

Type locality : Moshi, Kilimanjaro.

DISTRIBUTION :

Kenya from Taveta, through Ukambani to the Northern Guasso Nyiro, Kenia and N.-W. to Sotik where it meets the Uganda form.

DESCRIPTION :

Entire head and neck and upper breast yellowish-olive green, (more yellowish than in *V. c. salvadorii*,) becoming yellower on the lower breast and centre of abdomen, and greyish tinged with greenish on the flanks. Between the lower hind-neck and the mantle is a clearly defined blue-grey band which merges into the greyish-olive of the mantle, scapulars back, rump and upper tail-coverts. Lesser wing coverts at bend of wing purple-grey, remainder of the wing-coverts like the mantle; secondary and outer median coverts with wide yellow margin; primary coverts black; primaries and secondaries black with wide yellow edges to the former and narrow ones to the latter. Under-surface of wings axillaries and under wing-coverts pale grey. Thigh feathers centrally olive grey with whitish margins; leg feathering canary yellow. Under tail-coverts: lateral short ones pale olive grey with white ends, long feathers pale cinnamon with buffy-white tips and margins. Under surface of tail dark grey with pale greyish-white terminal band; upper surface pale leaden-grey with terminal inch very pale greyish-white washed with, and tinged greenish on outer webs. Eyes blue to silvery with outer ring of lilac; bill horn blue at tip *yellow or cadmium yellow* at the cere and nostrils, the bare area seldom exceeding 7 mm. Legs and feet coral red or red-madder. Wings 160-179 mm.

FEMALE :

Like the male but smaller.

JUVENILE :

The nestling has the crown, hind neck, mantle and wings pale olive grey with large pale yellow edges to the outer webs of the median and secondary coverts, yellow edges to the primaries and secondaries; rump pale greyish-olive; tail pale-grey with paler tips; throat almost bare, breast and abdomen covered in pale greyish down with just a tinge of green on the breast; under tail-coverts pale buff. Bill swollen laterally yellow ochre, grey tipped; Eyes ochre yellow; Feet yellow-brown.

From this stage the moult into the full feathered plumage is rapid and similar to that of the female.

HABITS :

The general habits of this race are similar to those of the rest of the group. We have records of their nests from March to July and in November to January. The nest is built in rather low trees, seldom more than 18 feet up. It is of the usual pigeon type, built entirely of thin twigs. The clutch varies from two to one egg; but whether the latter is actually the full clutch is difficult to say. We have frequently shot females with two ova almost ready to be laid, but with equal frequency, nests are found containing only one hard-sat egg. As the nest is a very shallow structure it is conceivable that one egg

gets knocked out as the parents leave the nest in a hurry. The call of this bird is a musical whistle ending in a double note; somewhat like "whit churu, whit churu, whit, tock tock" the last two several notes lower than the rest. The call carries quite a distance and is frequently the first indication of the birds presence.

Vinago wakefieldi wakefieldi, Sharpe, Wakefield's Green-tailed Green Pigeon.

Ref.: Sharpe, Proc. Zool, Soc. 1873, p. 715.

Type locality: Mombasa.

DISTRIBUTION:

The coastal zone of Kenya, with extensions inland along the Tana and Juba and the Usambara Range.

DESCRIPTION: MALE AND FEMALE ADULTS:

Very similar to *V. c. brevicera*, in general colour but differs from that species and other races of *calva* in having the upper surface of the rectrices olive-green with the terminal inch greenish-white. The grey band between the lower neck and mantle is not so pronounced and the purple wing-patch is mixed with grey distally. The eyes are white or cream; the bill is horny-grey at the tip and the basal cere is orange-red to coral-red; the feet are coral-red. Wings, 149-165 mm.

JUVENILE:

As in *V. c. brevicera* but tail greenish.

HABITS: See introduction.

Vinago delalandii granti, van Som. Delaland's Coastal Green-Pigeon.

Ref.: van Someren, Bull. B.O.C. XL. p. 20, 1919.

Type locality: Kilwa, T.T.

DISTRIBUTION:

The southern end of the coastal zone, being an extension into Kenya from the Pangani area of Tanganyika Territory.

DESCRIPTION: MALE AND FEMALE:

Head, neck and upper breast ashy-olive shading to greyish-olive on the lower breast, and to dark olive grey on the flanks. The abdomen and the vent are yellow. The thigh feathers are dark olive-grey edged with white; the leg feathers are yellow. The lower hind-neck is slightly greyish but not sharply differentiated from the mantle. The mantle, back, rump and upper tail-coverts are golden olive, lacking the soft

bloom found in *wakefieldi* and the races of *calva*. Most of the lesser wing-covert are golden-olive, except those at the " bend " of the wing, these are dark-greyish at the edge and dark-greyish-purple inwardly. The primaries and secondaries are black with narrow pale yellowish-white edging to the outer webs. The primary coverts are black, while the secondary coverts are dark-greyish olive merging to blackish towards the margin of the outer webs, and edged with yellow. The rectrices are mostly yellowish-olive; the outer pairs shaded with blackish on inner webs, all except the two central pairs, with pale greenish-grey terminal bars. The under tail-coverts are similar to those of other Green Pigeons. The eyes are pale blue with a whitish inner ring; the bill is bluish-grey at the tip with an orange-red basal cere; the legs and feet are orange-red to coral-red.

JUVENILE:

Unknown to me.

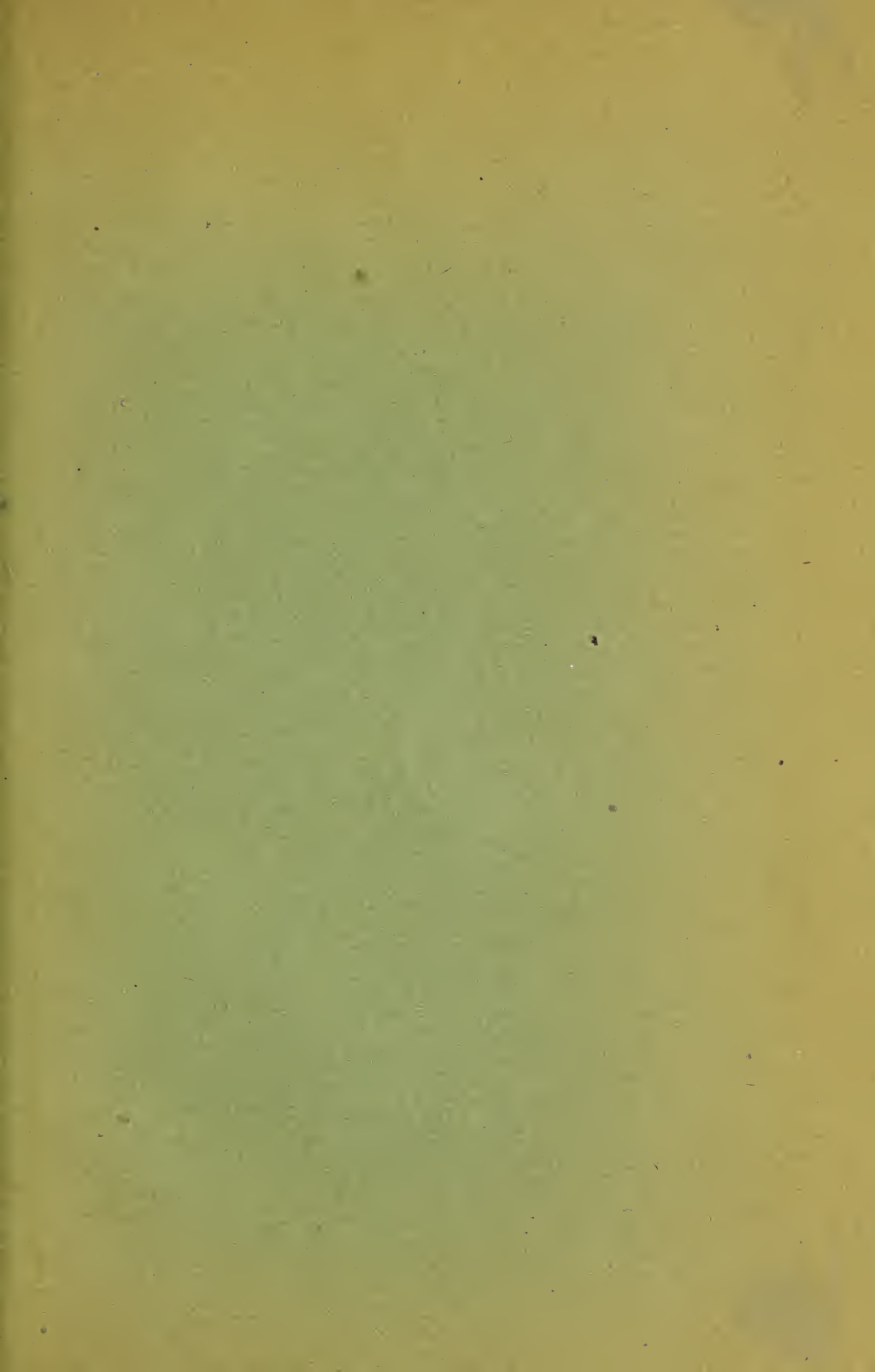
HABITS:

Very similar to the other Green-Pigeons, vide introduction.

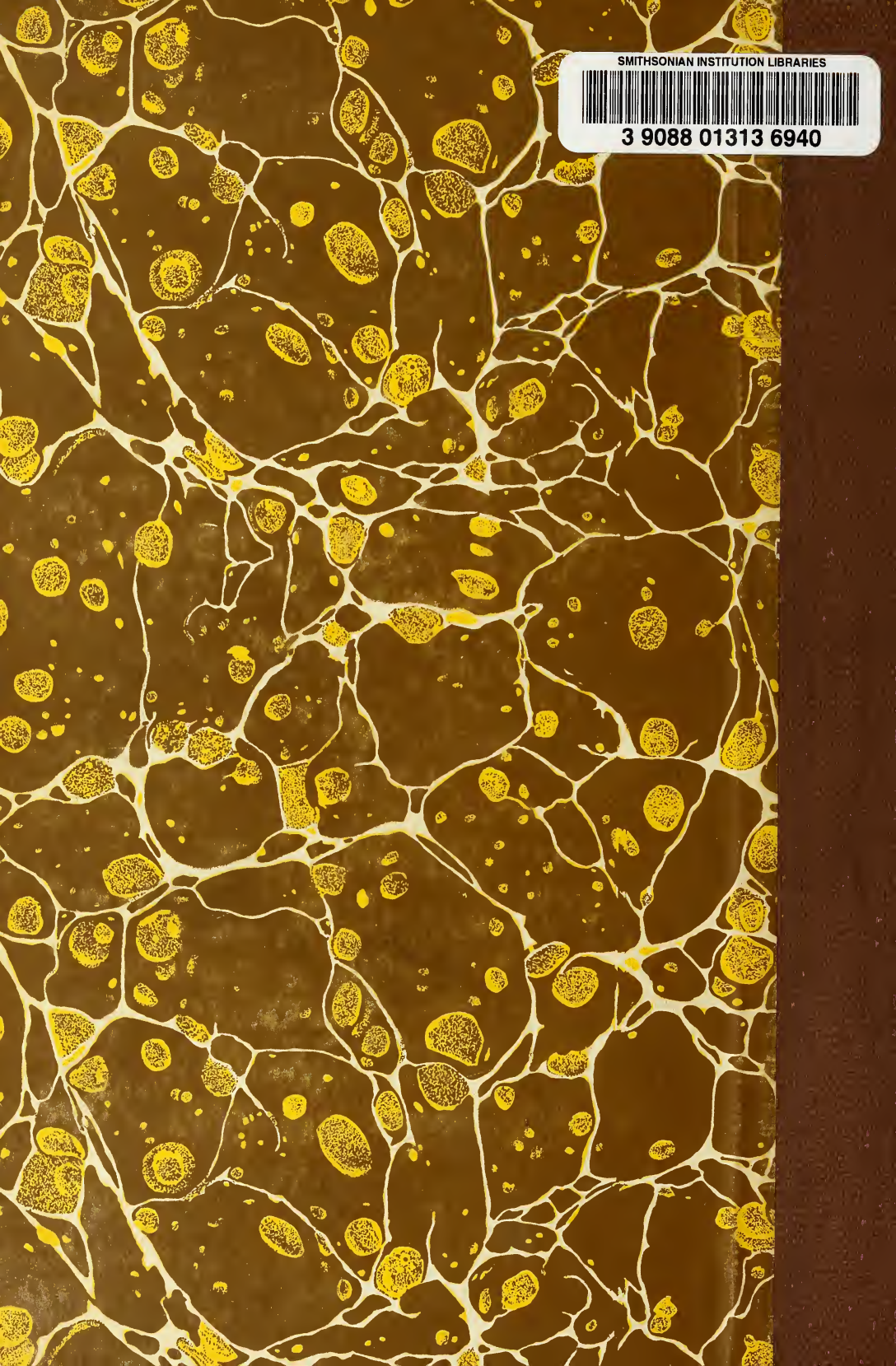


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VINAGO DELALANDII GRANTI, van Someren.







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